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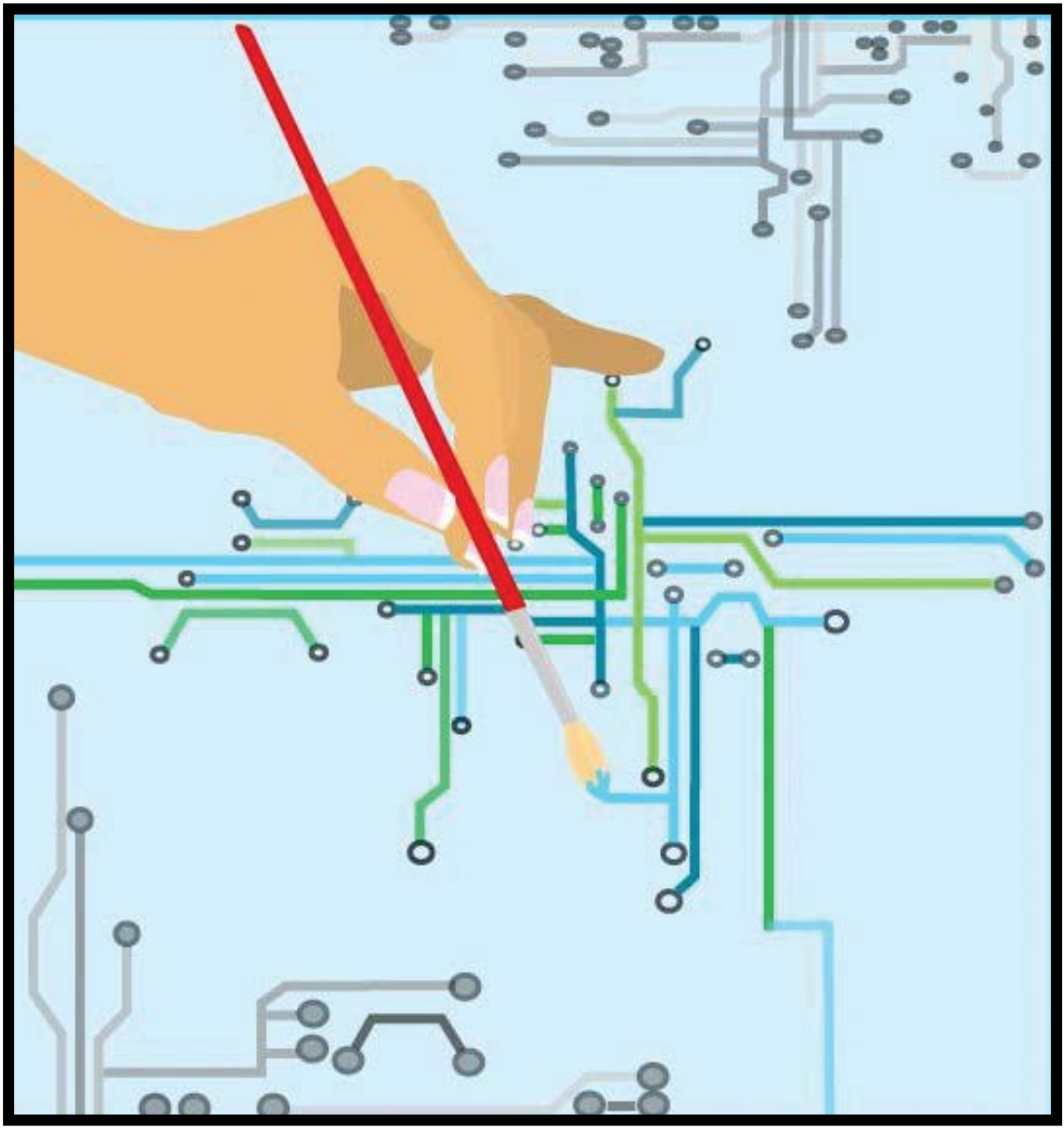

Technical COMMUNICATION

Journal of the Society for Technical Communication

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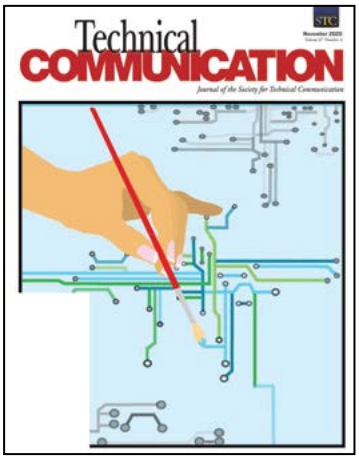

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Technical Communication publishes articles in five categories:

- Applied research – reports of practically relevant (empirical or analytical) research
- Applied theory – original contributions to technical communication theory
- Case history – reports on solutions to technical communication problems
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Felicia Chong and Tammy Rice-Bailey

Identifying Dimensions of Artistic Creativity in Technical Communication

During a recent panel we presented at the 2019 Council for Programs in Technical and Scientific Communication conference (Rice-Bailey et al., 2019), we addressed the topic of infusing technical communication pedagogy with artistic creativity through interdisciplinary partnerships. After our presentation, we had further conversations with colleagues about additional ways technical communication practitioners and educators included artistic creativity in the workplace and classroom. The result of these conversations led to the special issue that you are now reading.

DEFINING ARTISTIC CREATIVITY

While there is no codified definition of artistic creativity in the field of technical communication or related disciplines, a pair of psychology researchers (Ivcevic & Mayer, 2009) who published in the *Creativity Research Journal* have identified the following five content areas of artistic creativity: visual arts, music, dance, theater, and writing. Our definition of artistic creativity builds on this list and includes the definition of the arts as provided by the U.S. Code, which is often used in policymaking, including funding for the National Endowment for the Arts:

> The term "the arts" includes, but is not limited to, music (instrumental and vocal), dance, drama, folk art, creative writing, architecture and allied fields, painting, sculpture, photography, graphic and craft arts, industrial design, costume and fashion design, motion pictures, television, radio, film, video, tape and sound recording, the arts related to the presentation, performance, execution, and exhibition of such major art forms, all those traditional arts practiced by the diverse peoples of this country. [sic] and the study and application of the arts to the human environment.

INCORPORATING ARTISTIC CREATIVITY

The fine arts disciplines have been shown to partner well with industry to allow practitioners to enhance the technical and interpersonal skills necessary to their success. An example of such an interdisciplinary partnership is the University of Chicago Booth School of Business, which, in 2017, partnered with Chicago's Second City comedy theater to teach improvisation to its MBA students. The partnership was forged to enhance these students' communication, collaboration, and wellbeing through the theatrical genre of improvisational comedy (The University of Chicago Booth School of Business, 2017). Successful companies like Google, Apple, and Facebook have been cited as incorporating elements of the arts, performance, and/or play into their corporate environments. For instance, Google designed Broadway-themed conference rooms and workstations to look like giant Tinker Toys (Stewart, 2013). Coleman (2016) explained that organizations that "foster a workplace culture of creativity are likely to have happy, motivated employees who are more loyal and more productive." Furthermore, a study (Robert & da Motta Veiga, 2017) published in the *International Journal of Humor* shows a positive correlation between conversational humor and job satisfaction, which supports the argument that managers should allow or encourage humor in the workplace.

Artistic creativity also fits well in the technical communication classroom. Pedagogy associated with artistic creativity offers instructors a new lens through which to approach technical communication curricula and improves student engagement. In the last five decades, technical communication scholars have been participating in conversations about infusing

technical communication with artistic creativity. Topics that have been examined include art and film music (Richards, 2009), beauty/makeup (Chong, 2018; Ledbetter, 2018), cinema/film/screenwriting (e.g., Daffer, 1970; Gillette, 2005; Shelton, 1993), classical art forms (Laplante & Flaxman, 1995), humor and comics (Cohen, 1992; Cooper, 1996; Weal, 1986; Yu, 2015), improvisational theater (Rice-Bailey, 2020), music (e.g., Girill, 1989; Nelson, 1989; Wiley, 1993), poetry (Welch, 2010), and storyboarding (Balzotti, 2016; Kody, 1992; Larkin, 1996).

Because of such recent interdisciplinary collaborations, this special issue (re)examines how technical communication researchers and practitioners are using artistic creativity in the classroom and workplace. More specifically, we asked the question: What does artistic creativity look like in contemporary technical communication instruction and practice?

EXPLORING ARTISTIC CREATIVITY IN THIS SPECIAL ISSUE

The articles in this special issue illustrate a range of methods for examining the intersections between beauty, creativity, and technical communication and developing or implementing artistic creativity in instruction and practice. On the surface, practices such as storyboarding and creating personas may not appear to be relevant to artistic creativity. However, when we examine these common classroom and workplace practices through the lens of art and creativity, we are presented with a unique way of (re)considering our technical communication practices and pedagogy.

Kostlenick's article highlights cultural influences on both the visual arts and on technical communication. His comprehensive examination describes artifacts from the 16th to the 21st centuries and discusses how ancient and modern aesthetic theory contribute to the definition of beauty. Kostlenick explains that research and usability studies provide evidence for the functional value of aesthetics, and he examines the relationship among the Design Methods Movement, the design process, and the nature of creativity. As Kostlenick notes, "The pursuit of beauty continues today in practical communications through the deployment of culturally-based conventions and design principles associated with beauty."

Like Kostlenick, Hardesty and Hollinger seek the pairing of technical and scientific fields with beauty, art, and creativity. They advocate for the field of technical communication to embrace "creativity" and "beauty" as key terms, and note that the result of this could "lead students and practitioners to reframe both themselves and the work they do as technical communicators to embrace the beauty in the processes and products of technical communication." Their piece examines classroom and workplace practices from both technical communication literature and their own experience, such as essentializing and sketchnoting, infographics and data visualization, beautifying text, film, and storytelling. They provide insight into the benefits of using creative approaches to help students and practitioners think more intentionally about audience, purpose, and visual elements in technical communication.

In their article on the relationship between user personas and creativity, Lanius, Weber, Spiegle, Robinson, and Potts weigh in on the debate regarding the usefulness of personas. Looking specifically for a link between creativity and personas, these authors adapted a drawing test from the field of psychology with students from across several disciplines. In this experiment, the authors asked participants to draw aliens, and the authors then rated these drawings (using an established set of criteria) for level of creativity. Of the over 150 student participants, only some were instructed to draw for a particular persona. Results of this experiment call into question some of the beliefs about the benefits of using personas in the classroom and the workplace.

Finally, in Kungl, Hargrove, and Hargrove's case study, the authors illustrate how a publishing company used traditional technical communication techniques along with creative writing, graphic design, photography, and illustrating to refine its core values statement. These authors assert "writing a set of core values should do more than check off a box under 'good business practice.'" They go on to detail the production of high-quality artifacts in a case that was successful because the organization used "technical writing to provide information and the fine arts to drive emotional impact."

The articles presented in this special issue serve as an introduction to infusing technical communication practice and pedagogy with artistic creativity. Our hope is that these articles encourage you to (re)examine your own work (whether it be in the workplace or in the classroom) through the lens of artistic creativity. Perhaps you, too, will find unique opportunities to incorporate artistic creativity into this work.

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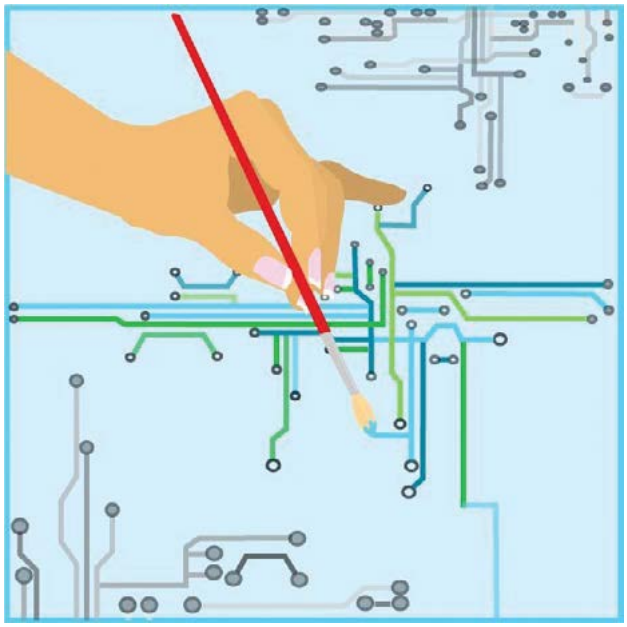
On the Cover



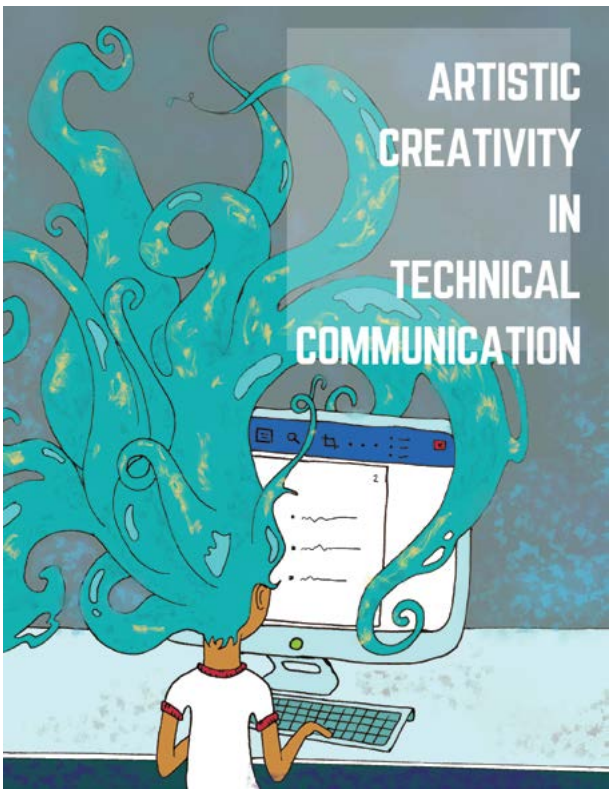
ARTIST'S NOTES

I made this design, keeping in mind traditional ideas of art and technical communication. A paintbrush is a classic representation of art because of the amount of creativity and skill that goes into painting. I chose a computer board because of its association with technology and complexity—two things that are associated with the jobs of most technical writers. In tying the two ideas together, I emphasize that technical writers put more than just technical skills into communicating.

ABOUT THE ARTIST

Mykaela Chaffin is an undergraduate student at Eastern Kentucky University studying for a degree in English. Along with her degree, she is pursuing a certificate in technical writing, a minor in visual media, and a certificate in Japanese. She enjoys reading and hopes to work as an editor in the future. She is available at mykaela_chaffin7@mymail.eku.edu.

Honorable Mention



ARTIST'S NOTES

I wanted to illustrate the creativity of thought that is not always associated with technical writing or communication. It was all hand drawn on a digital tablet and transferred over as a jpeg. The image is supposed to represent a stream of thoughts and ideas flowing out of a person's head as they communicate over a social media website. The hair, obviously, is meant to embody all of the artistic aspirations of a student, teacher, or any professional where technical communication is relevant in their field.

ABOUT THE ARTIST

Jonathon Collins is a graduate assistant at Eastern Kentucky University, where he finished his undergraduate education earlier this year with a Bachelor of Arts in English. He is pursuing a Master of Arts in English Literature and has a deep interest in 20th century American literature. He lives in Richmond, Kentucky, and plans on teaching at the university level after finishing school. He is available at jonathon_collins168@mymail.eku.edu.

The Art of Visual Design: The Rhetoric of Aesthetics in Technical Communication

By Charles Kostelnick

ABSTRACT

Purpose: By recognizing the importance of aesthetics, which have infused technical communication for centuries, designers can more effectively meet audience expectations and achieve key rhetorical goals, including heightening audience engagement, arousing emotion, and enhancing credibility and persuasiveness. Designers can integrate aesthetics into technical communications by deploying visual conventions generated by larger cultural forces, by applying design principles that foster beauty, and by inventing novel forms.

Methods: Aesthetic theory, both ancient and modern, and insights from practitioners create a foundation for defining beauty; research and usability studies examining audience preferences provide empirical evidence about the functional value of aesthetics; and aesthetic developments in the nineteenth century and the subsequent shift to Modernism serve to illustrate the cultural influences on design. The Design Methods Movement affords a springboard for exploring the design process and the nature of creativity.

Results: Although theorists and practitioners hold conflicting views on the role of aesthetics in functional design, many consider it an important factor that makes designs attractive and engaging to audiences. The pursuit of beauty continues today through the application of culturally based conventions and design principles associated with beauty.

Conclusion: The cultural knowledge embedded in visual aesthetics operates silently, even imperceptibly, as technical communicators deploy aesthetic conventions to meet audience expectations and to streamline their design processes. At the same time, technical communicators need leeway for creativity and novelty as they adapt visual elements to specific rhetorical situations, often seeking audience feedback about their aesthetic preferences to create engaging, persuasive, and usable designs.

Keywords: aesthetics in technical communication, visual rhetoric, history of information design, technical illustrations, data visualization

Practitioner's Takeaway:

- Although aesthetic elements are often seen at odds with functional design, they continue to be a major factor in designing text, illustrations, and data displays.
- Deploying aesthetic elements has several rhetorical benefits, including engaging audience interest, enhancing clarity and persuasiveness, arousing emotion, and strengthening credibility by meeting audience expectations for effective design.
- Designers can integrate aesthetic elements into technical communications by including culturally based conventions and by applying design principles associated with beauty, including parallelism, balance, color, and details.
- Designers can measure the effectiveness of aesthetic elements both qualitatively and quantitatively by seeking feedback from audiences about their design preferences.

With advancements in digital technology, visual communication has played an increasingly important role in technical communication. Within the US and around the globe, visual communication encompasses a wide array of forms, including typography, page and screen design, data visualization, illustrations, and icons. These forms appear in a wide variety of communications ranging from instructions, reports, and descriptions to warnings, websites, videos, and social media. Visual language has become a critical factor in designing usable communications, and its presence in our field is likely to become even more pervasive in the future. However, because of our focus on clarity and functionality, we can easily overlook the beauty that permeates information design and the role of art and aesthetics in enabling designers to achieve their rhetorical goals.

Design as an art form enriches technical communication in several ways, some of which are explicit, intentional acts while others are more collective, social, and implicit. On the one hand, designers deploy visual language in a variety of forms—typefaces, pictures, colors, and other visual elements—and artfully compose them for a given communication, aesthetic choices that are idiosyncratic to a specific designer and situation. On the other hand, designing and interpreting these many forms of visual language rarely happen in a cultural or aesthetic vacuum. Throughout the history of design, aesthetic movements in painting, architecture, and other arts influenced technical drawings, typography, and data design. In fact, it's hard to imagine any visual elements in technical communication that haven't been shaped by representations in the fine arts and the broader social and cultural forces that foster them. That convergence culminated in the early twentieth century when Modernism explicitly melded aesthetics and functional design, with geometrical forms and perceptually based concepts (e.g., contrast, focal points) dominating the visual landscape, as they still largely do today.

The cultural knowledge embedded in visual aesthetics, however, operates silently, even imperceptibly, as technical communicators deploy the conventions of visual language to streamline their design processes and to match the aesthetics and visual style of a given era in order to meet audience expectations. Conventions encompass all areas of visual communication, ranging from typography and page and screen design to illustrations and data visualization. Visual conventions are continuously shaped and sustained by discourse communities—disciplines, organizations, and cultures—as these conventions emerge, evolve, and expand (and sometimes lose) their currency (Kostelnick & Hassett, 2003). Aesthetics play a key role in shaping conventions, especially through the influence of culture, as I will illustrate with both historical and contemporary examples. Nonetheless, despite the pervasive role of visual conventions in shaping visual language, technical communicators need leeway for creativity and even novelty as they adapt visual elements to specific rhetorical situations, often seeking audience feedback to ensure effective designs. And whether or not these aesthetic elements have explicit functional value—and often they do—they still achieve rhetorical ends: engaging and persuading audiences, appealing to their emotions, and engendering their trust.

In this article, then, I will begin by exploring conflicting perspectives on blending art and practical design. Then I will establish the longstanding relationship between aesthetics and technical communication, and I will explain the nature and origins of beauty and how it can be invoked in information design. I'll then examine how the visual language of technical communication embodies conventional codes that accrue from changes in aesthetic taste, focusing on nineteenth-century design and the shift to Modernism that followed. Finally, I'll examine creativity and design processes for creating communications that integrate art and aesthetics. Along the way, I will explain and analyze the implications for contemporary practice in both print and digital communications.

THE ROLE OF ART IN PRACTICAL COMMUNICATION: CONFLICTING VIEWS

To the extent that technical communication is an art form, what role do aesthetics—principles and cultural values that we associate with beauty—play in its visual design? How exactly does visual art manifest itself in technical communication? Do designers blend art and function? If so, how? Although these questions can be answered in several different ways, we might be skeptical about even asking them in the first place.

Aesthetics in Technical Communication

As technical communicators, we value information products that are functional, efficient, and user-centered. As a result, we generally believe that functionality and aesthetics are incompatible: Like water and oil, they possess conflicting and irreconcilable qualities that just don't mix. Allowing visual art to infiltrate the design process exposes it to subjectivity and frivolous excess, which sound dangerous, out of control, and inappropriate. In short, technical visuals should remain an objective, art-free zone with no place for aesthetics.

This concern about art infiltrating practical communication is shared by influential designers. For example, Edward Tufte (1983) belittles charts and graphs designed by artists who dress up data to make it more palatable to their audiences (pp. 79–80). In doing so, designers sacrifice clarity and complexity for feckless embellishment, what Tufte calls "chartjunk" (pp. 107–121). Other designers and theorists have expressed (or at least implied) a similar concern about art or ornamentation creeping into aspects of practical design, including typography (Warde, 1956), data design (Bertin, 1981; Few, 2012, pp. 2–9, 141–44), and color (Brockmann, 1991). And most textbooks in the field of technical communication advocate minimalist design, free of visual elements that distract readers, impede visual processing, and merely arouse emotion. Often when aesthetic elements are invoked, moreover, they are regarded as mere surface features that designers deploy at the last minute to "pretty up" communications.

Not all designers, of course, have rejected the incursion of art (or artistic methods) into practical communication. Indeed, some of these same designers acknowledge, even celebrate, the aesthetic qualities of effective design. In the realm of data design, Tufte (1983) devotes a whole chapter to aesthetic elements (pp. 177–190); a TED Talk by designer David McCandless (2010) titled "The Beauty of Data Visualization" explains the creative potential of digital design; Noah Iliinsky (2010) claims that a "beautiful" data design should contain "novelty" and engender a "spark of excitement" (p. 1); and Nathan Yau (2013) explores several highly creative works of contemporary "data art" (pp. 74–84). On a more theoretical level, Lau and Vande Moere (2007) examine "information aesthetics" in data design—that is, "the degree of artistic influence" on a given data display and "the amount of interpretative engagement" it engenders (p. 88)—and develop a design model combining data, aesthetics, and interaction (p. 89). Dragga and Voss (2001), moreover, argue on ethical grounds for including pictorial elements in charts to foster emotion and empathy, and Carol David (2001) illustrates the historical connections between the fine arts and portraits of individuals and professionals, particularly women.

In the realm of typographical and document design, aesthetic movements and culture more broadly have long provided a theoretical and intellectual foundation for practice, as Ellen Lupton (2004) demonstrates with the evolution of text design. Indeed, most popular guidebooks draw from an aesthetic pool of concepts to explain (or inspire readers to implement) design principles and practices (e.g., Williams, 2015; Parker, 1989; White, 1988), though with no pretense that designers aim to create fine art. Indeed, Jan White (1988) compares typographical design to painting, which for most practical communications functions at the "workaday, house-painting level" (p. 1). Aesthetics have also been acknowledged as playing an increasing role in Web and interface design (Reinecke & Bernstein, 2011; Tractinsky, n.d.) and enhancing the user experience overall.

Whatever the nature of the design, aesthetics are deemed to have rhetorical impact, partly by arousing emotion and heightening audience engagement. As Donald Norman (2004) points out, aesthetically pleasing product designs are more useful because they generate positive emotions (p. 19). In the realm of practical communication, Kathyrn Riley and Jo Mackiewicz (2011) explain how aesthetic elements can make documents "visually appealing" and can capture the attention of their audiences (pp. xx–xxi). As Karen Schriver (1997) puts it, "Readers' interpretations of documents are shaped by thinking and feeling, by the subtle interplay of cognition and affect" (p. 189). Aimed at captivating their audiences with artful creativity, websites like Dribbble (2020) feature online galleries of applied illustrations, animations, and text designs. Indeed, the very covers of *Technical Communication* are replete with beautiful, captivating images, many of which have been designed competitively to capture the attention of readers.

THE AESTHETIC TRADITION: PERSUASIVE IMAGES OF TECHNOLOGY AND PRACTICAL INFORMATION

Using beautiful images to engage audiences, arouse their emotions, and persuade them has occurred for centuries in various forms of technical and professional communication. Figure 1 shows a drawing from a nineteenth-century collection of the French architect Viollet-le-Duc (1875–1877), famous for his drawings and restorations (including Notre-Dame cathedral in Paris). This architectural rendering visualizes an Italian country house that includes a cutaway on the side of the building that provides both a view of its structure and a glimpse into its interior, pictorial elements that enrich the clarity and usefulness of the image. The house is embellished with vegetation (urns and palms) and is situated in a serene, picturesque landscape in which human figures immerse themselves. Of course, we could argue that an Italian villa of this style is certainly intended to possess beauty and that its depiction as a beautiful object, complete with well-shaped trees and an expansive lawn, should not surprise us. However, this visualization technique has much wider, more long-term currency, exemplified by contemporary renderings of houses, office buildings, and public spaces that create appealing pictures of designed objects in their contexts of use (see Ashwin, 1984). A similar descriptive beautification occurs in photos in annual reports, which show executives and employees in their best, most ideal poses to create a positive impression on the audience. In all of these situations, an attention to aesthetics heightens persuasion.

Figure 1. Drawing of an Italian villa with a cutaway revealing its interior (Viollet-le-Duc & Narjoux, 1875–1877, Vol. 1, Plate 33). Courtesy of Iowa State University Library Special Collections and University Archives.

In fact, practical drawings have incorporated aesthetics for centuries as a means to persuade audiences. The visual arts (painting, drawing, architecture) have long shaped technical communication, beginning with early engineering drawings in the Renaissance and continuing into the Enlightenment and the Romantic and Victorian eras. Figure 2 shows a mechanical drawing from Agostino Ramelli's *Le Diverse et Artificiose Machine* (1588) that envisions a water-pumping apparatus. The striking three-dimensional perspective view, the carefully arranged landscape around the well, and its stylized vegetation and tree foliage emulate paintings from the Renaissance and make this picture more credible and persuasive. At the same time, this picture departs from fine arts pictures by deploying techniques suited to its practical aims. For example, the neatly cleaved cutaway beneath the ground clearly displays the hydraulic technology, revealing its gears, pipes, and other parts, which are lettered to correlate with textual notations—picturing conventions that emerged in early engineering drawings (see Kostelnick & Hassett, 2003, pp. 36–37). These mechanical parts enable the figures operating the pump to experience strong agency, illustrating the efficacy of new and innovative technology (see Ferguson, 1992) while invoking the empowering humanistic vision of the period that fostered creativity in both engineering and art. In these ways, the aesthetics of technology infuse this picture, making it both usable and persuasive—attributes exemplified by Leonardo da Vinci's engineering drawings and by the flood of drawings that succeeded them (e.g., Besson, 1578; Zonca, 1607; Böckler, 1673).

This synergy between art and technology initiated in the Renaissance continued well into the Enlightenment in the eighteenth century with the shift in aesthetics toward simplification and greater transparency, agency, and egalitarianism. Figure 3, for example, pictures a weaving machine in a plate from Diderot and d'Alembert's influential *Encyclopédie* (1751–1765), which included 17 volumes of text and 11 volumes of plates (*Recueil de Planches*, 1762–1772),

Aesthetics in Technical Communication

many of them picturing tools, machines, manufacturing methods, and a wide range of practical trades. Figure 3 shows a machine for making ornamental tassels and fringes, its lone operator busily at work, a strong and assertive hero-agent that typified renderings of technology similar to Ramelli's in Figure 2. The operator's strong agency reflects the Enlightenment program to democratize knowledge by broadening the pool of who was pictured—not just the elite classes, but virtually anyone engaged in a trade—and by making that knowledge accessible to all. Contentedly ensconced in his cubicle, the operator embodies the aesthetics of the period: rational, lucid, and egalitarian.

Figure 2. Late sixteenth-century drawing with a cutaway view showing the mechanical parts of a water pump (Ramelli, 1588, Figure X). Courtesy of Iowa State University Library Special Collections and University Archives.

Another example of an aesthetically pleasing object appears in Figure 4, a late nineteenth-century drawing of a paper-cutting machine (Sanborn, 1880). Rendered with shades and shadows, the machine appears as an ideal object, situated in abstract space without contextual details. Like many newly invented machines of the time, the technology is pictured as a desirable object, an affecting assemblage of metal gears, handles, adjusting wheels, and other parts, right down to the pins and bolts. The style of the drawing, with its fine ink hatching to show subtle variations in shading and light, gives it a realistic, almost photographic presence. This precise, exacting aesthetic of the new industrial age pervaded most drawings of technology at the time, from steam engines and locomotives (see Baynes & Pugh, 1981) to factory machines, farm implements, and hydraulic equipment. These machines, large and small alike, fueled the Victorian age, and their epideictic visualizations paved the way for the functional aesthetics of early Modernism.

Some practical drawings also embody aesthetic properties because of their narrative qualities, their

Figure 3. Drawing of a weaving machine with a lone operator from Diderot and D'Alembert's *Recueil de Planches* (1762–1772, Vol. 11, "Passementerie," Plate VIII, Figure 1). Courtesy of Iowa State University Library Special Collections and University Archives.

ability to tell stories (see Kostelnick, 2019, pp. 97–130), which typically occurs in instructional materials—for example, manuals for operating equipment and wordless instructions for assembling products and completing do-it-yourself projects. Many visual narratives use a highly abstract style that mirrors or even mimics the composition of a comics-style narrative, such as issues of the U.S. Army's *PS Magazine* illustrated by Will Eisner (1951–1971) or the *9/11 Report* illustrated by Jacobson and Colón (2006). A comics-style series of pictures appears in Figure 5, which shows a page from instructions by the National Institute for Occupational Safety and Health for safely using nail guns (U.S. Department of Health & Human Services, 2013). In a sequence of pictures and words, a veteran construction worker tells a rookie about the serious and potentially dangerous business of using a nail gun to frame buildings—here explaining how to prevent the tool from accidentally discharging. The drawings exemplify the casual freehand aesthetic of the comics medium that most contemporary readers have experienced in a superhero story, graphic novel, set of instructions, or even a textbook. The conventional visual language of this aesthetic—an abstract series of pictures with figures and word bubbles—makes a rather gruesome topic accessible and inviting—and remarkably persuasive.

Story-telling with *animated* illustrations can create an even more seamless and cohesive narrative, which is simplified and enhanced by beauty. Figure 6, for example, shows a screenshot from an animated illustration created by Phil Szczepaniak (2020) that narrates how a wood processing plant converts tree logs into strands (fragments) for making OSB, a common building material used in houses and other structures. This visualization, accompanied by up-tempo music, shows the journey of the logs as they are loaded into a hopper and stripped of their bark (pictured earlier in

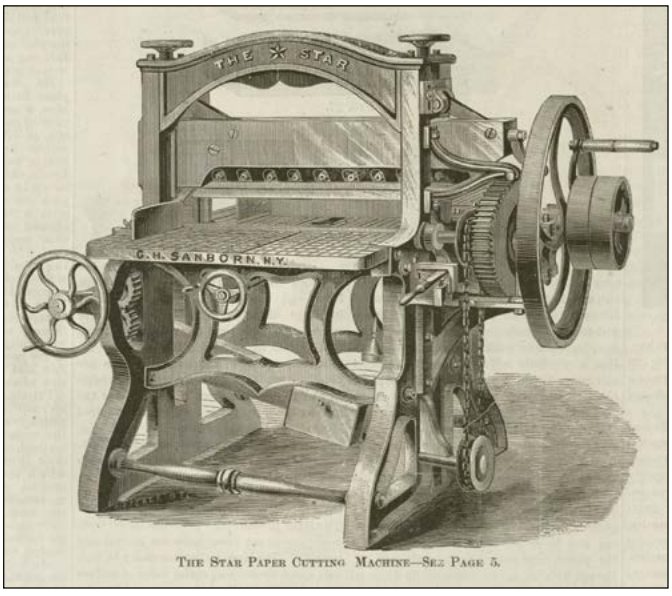


Figure 4. Detailed drawing of the Star paper-cutting machine that appeared in *American Machinist* (Sanborn, 1880, p. 4). Courtesy of Iowa State University Library Special Collections and University Archives. Copyright, Endeavor Business Media. Reprinted by permission.

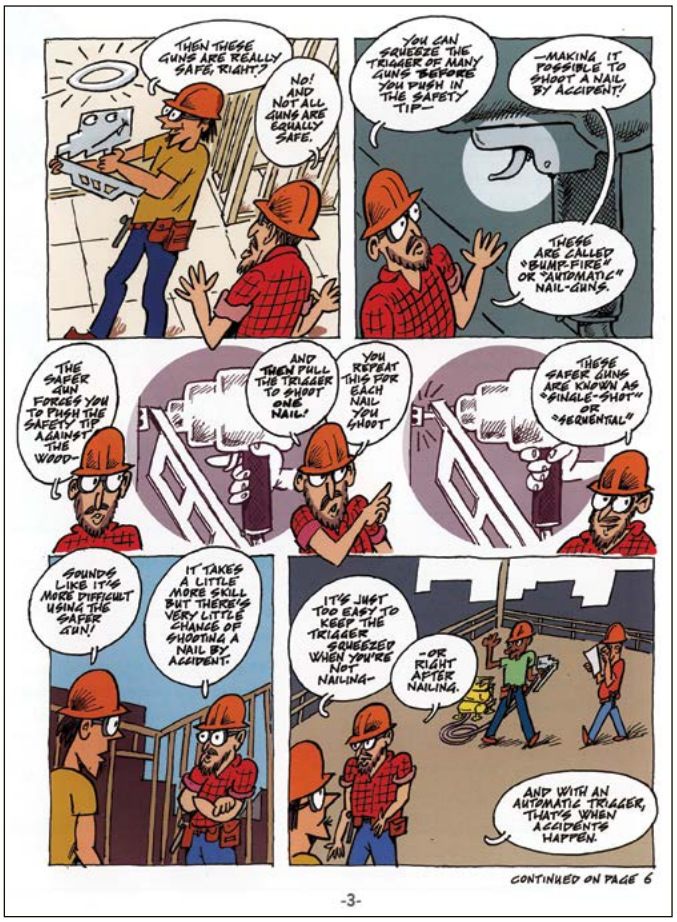


Figure 5. Comic-style instructions that illustrate procedures for operating nail guns safely (U.S. Department of Health & Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, & Thorkelson, 2013, p. 3). Courtesy of the National Institute for Occupational Safety and Health.

the animation) and then sorted and grouped as they head to the stranding machine, which appears here on the right. The traveling logs are all uniform in their color and shape—ideal logs free of knots, bends, and blemishes that would distract the audience from the smooth, carefree operation of the machines. The plant and its moving parts are shown in contrasting cool and warm colors (blue and orange) and are abstracted from their surroundings, which keeps the focus on the narrative and carefully controls what the audience experiences. As Phil observes on his 3deeit.com website, he designed the animation to capture the attention and engagement of his audiences, especially at trade shows. The aesthetics of this visual narrative contribute substantially toward achieving that goal.

As we can see from these examples spread across a long stretch of history, images in technical and professional communication have been shaped at least in part by aesthetic factors and influences, which enhance both the clarity of the images and the engagement of their audiences, often through emotional appeals. And as we've seen, aesthetic elements also contribute to the persuasive power of images to convince audiences that the objects visualized are credible, effective, and beneficial. The idea, then, that practical images have an affinity with, or are at least compatible with, art or aesthetics reflects a longstanding tradition.

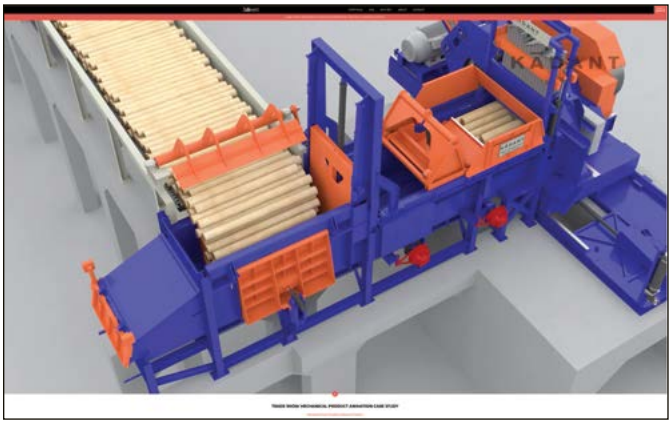


Figure 6. A 3Deeit animated illustration by Phil Szczepaniak of a Kadant wood processing machine for stranding logs (Szczepaniak, 2020). Courtesy of 3deeit Inc. (www.3deeit.com). Reprinted with the permission of 3deeit Inc.

PRINCIPLES OF PRACTICAL ART: THE ORIGINS AND NATURE OF BEAUTY

Applied forms of design that are created with a skilled "craft," as Howard Risatti (2007) argues, can achieve aesthetic legitimacy on their own merits as functional products, distinct from works of fine art. If art and aesthetics, then, also play a role in designing practical information, at whatever skill level, how should we describe these elements? What visual attributes do they have, and what effects do they have on their audiences? Generally, aesthetics are typically associated with beauty: in our field, the beauty of pages, screens, illustrations, or data displays that have pleasing proportions, that are consistent, and that integrate complementary forms and colors that are soothing to the eye—in other words, visual compositions that embody effective design. The arrangement and semiotic interplay of these design elements parallel what Michael O'Toole (2011) calls "the Compositional function" of a picture or other designed artifacts (pp. 23–29).

Designers of technical information invoke beauty in many of the cognate principles and concepts they apply in composing their communications. A study by Miles Kimball (2013) provides a roadmap: Concepts like balance, rhythm, unity, and alignment, among many others, all invoke the quest for beauty as well as relate closely to perceptual principles. Similar principles linking beauty and perception are advocated by authors of popular design guides like Robin Williams (2015) as well as in academic courses in graphic and document design.

Our ideas about beauty and its relation to perception (as well as culture and emotion) derive from many sources, both ancient and modern. The Roman architect Vitruvius (C. 30–20 BC/1826), for example, claimed that "Beauty is produced by the pleasing appearance and good taste of the whole, and by the dimensions of all the parts being duly proportioned to each other" (p. 15). This classical standard for beauty—produced by good proportion among the elements in a composition, including symmetrical arrangements (p. 12)—dominated design at least through the Renaissance and Enlightenment (see, for example, Beaumont, 1752, p. 12). Of course, as Umberto Eco (2004) points out, standards for defining beauty vary from one culture or historical era to another (p. 12). In the modern world, beauty has increasingly been defined by the pleasurable feelings that it evokes. George

Santayana (1896/1955), for example, defines beauty as "an emotion" (p. 31), as "pleasure objectified" (p. 33), as "an ultimate good, something that gives satisfaction to a natural function, to some fundamental need or capacity in our minds" (p. 32). Nonetheless, he identifies certain traditional qualities that arouse these emotions, among them various aspects of symmetry, including "bilateral symmetry" (p. 58), "recognition and rhythm" (p. 59) and "unity in variety" (p. 61).

The idea that beauty induces pleasure was a longstanding belief—held by Vitruvius and others in the classical world—and in the Enlightenment, Edmund Burke (1759/1967) described the sensory stimuli that cause it. In his *Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful*, Burke defined attributes of the beautiful by contrasting them with those of the sublime. According to Burke, objects that possess beauty are "small" and "smooth" (with "gradual" changes in shape), possess "delicacy," and have "clean and fair" coloring (pp. 112–117; 151; 155–160); beauty, moreover, is also closely associated with "grace" and "elegance" (pp. 119–120) and evokes emotions of pleasure and love (pp. 91, 124). The sublime, on the other hand, is fostered by "obscurity" (pp. 58–64), "vastness" (pp. 72–73), "infinity" (pp. 73–74) and "darkness" (pp. 80–81) and arouses feelings of pain, terror, and "astonishment" (pp. 39, 57–58). In technical communication, which emphasizes clarity and transparency, visual elements gravitate toward beauty—toward forms that are geometrical, elegant, and harmonious—in other words, those that most please us. Nonetheless, the sublime and the grotesque also have a place in practical visuals, typically in safety warnings that show people in distress: electrocuted figures, fingers caught in machines, eyes and lungs exposed to poisonous gases, and bodies penetrated by nails, which appear elsewhere in the nail gun safety guide (Figure 5).

Beauty has also been defined mathematically, beginning at least with the ancient Greek philosopher Pythagoras, who discovered the geometrical origins of beauty in the proportional relationships of forms (Eco, 2004, pp. 61–87). In architecture, the geometry of triangles, circles, and other shapes creates the underlying framework for facades, floor plans, and structural engineering. Likewise, practical communications often employ mathematical ratios to achieve aesthetic effect. In document design, the rectilinear grid that structures information on a page has its roots in Cartesian mathematics and the rational worldview of the eighteenth century (Williamson, 1986). Likewise, newsletters are typically set in three columns (or multiples of four or five), a mathematical pattern that's both functional and pleasing to the eye. Websites also have similar compositional properties based on ratios and relationships that provide the underlying structure for text and images. In data design, the mathematical proportions of the "Golden Rectangle" (Tufte, 1983, pp. 189–190) are often followed, whereby the width (X-axis) of a line or bar chart (or scatterplot) is visibly wider than the height (Y-axis), a geometry that gives the aspect ratio both stability and variation. In all of these instances, structural integrity and consistency infuse the design with beauty.

This mathematical aesthetic can also be found in drawings that reveal proportions and detail. Figure 7, a line drawing of a revolving steam engine from

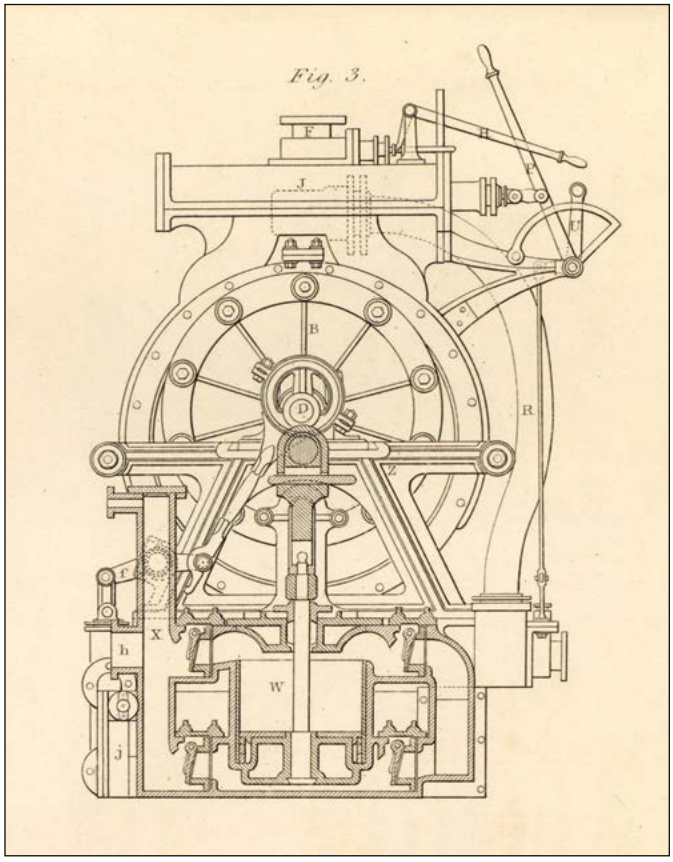


Figure 7. Mechanical drawing of Borrie's revolving steam engine (Artizan Club, 1855, Plate XXI, Figure 3). Courtesy of Iowa State University Library Special Collections and University Archives.

the mid-nineteenth-century (Artizan Club, 1855), visualizes an explicit array of mathematical facts. The flat, two-dimensional drawing (here in cross section) became the standard method of representation as mechanical engineering evolved as a discipline and required greater precision. The drawing displays all of the fixed and moving parts—levers, rods, boiler tubes, and other steam engine components—some of them represented with cross hatching (showing areas cut through) and with dashed lines (showing surfaces behind the front plane) and annotated with upper- and lowercase lettering. This abstract, rational explanation of this complex object is steeped in its own visual logic, as elegant and unadulterated as a mathematical equation.

Engineering drawings—especially those from the nineteenth century (like Figure 7) that show the relationships between the mechanical parts and gears of steam engines and other powerful machines—possess beauty because of their geometry, spatial arrangements, and intricacy. Exploded drawings also exhibit beauty, with their objects elegantly floating in space along a central axis (see Kostelnick & Hassett, 2003, pp. 64–65). These drawings are fictions because objects never float in space in such an orderly pattern, nor are machines shown in cross section (like the one in Figure 7) actually sliced through, nor do water pumps (like the one in Figure 2) have the earth and masonry removed so we can see their mechanical parts: In each case, the drawing conveniently

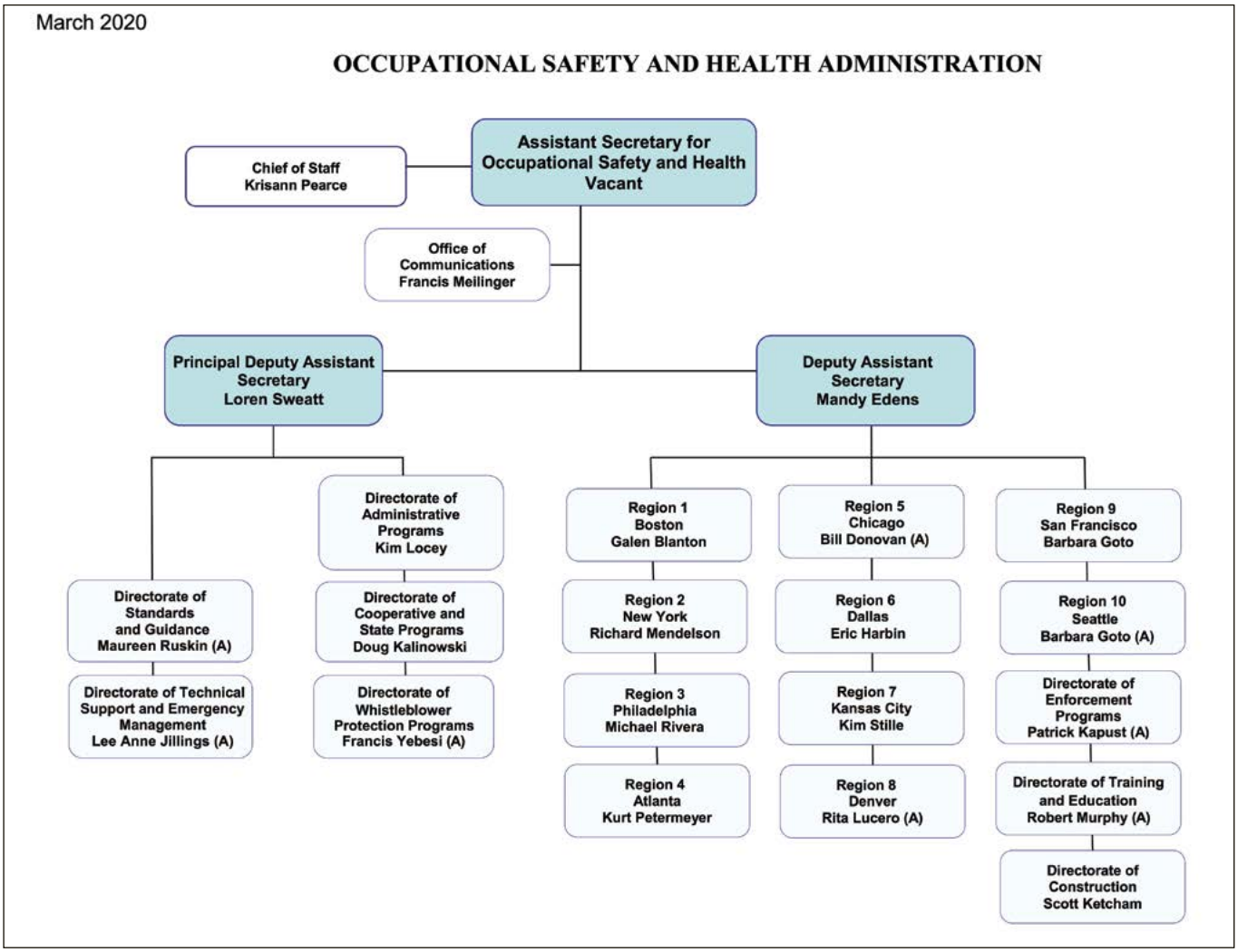


Figure 8. Organizational chart showing key personnel at OSHA (U.S. Department of Labor, Occupational Safety and Health Administration, 2020).

and conventionally side-steps reality in favor of an orderly, functional, and beautiful rendering.

This kind of structural elegance that persuades us to accept an altered reality also appears in organizational charts, where the arrangement of positions and people in an abstract network both clarifies and simplifies their relationships. Figure 8 shows the organization of key personnel in the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), including assistants to the secretary, national directors, and regional administrators. Visualizing these positions on the chart with centered text surrounded by boxes (with smooth, rounded corners), aligned vertically and horizontally and connected by linework, gives the display a disciplined structure that enhances its ethos. At the same time, the modest splashes of turquoise provide points of emphasis and lighten the tone by evoking a popular contemporary color, revived from the 1950s. Overall, the chart displays an airy, understated elegance that typifies contemporary digital design. Of course, depending on the nature of a given organization, this neat, highly structured arrangement of people and their relationships to one another is often not quite as clear-cut and simple as the chart that visualizes them. By using the conventional visual language of the genre, organizational charts beautify the truth to create an image, however closely connected to reality, of an orderly and coherent world, an aesthetic enhancement that both persuades audiences to believe in this world and bolsters their confidence in the display.

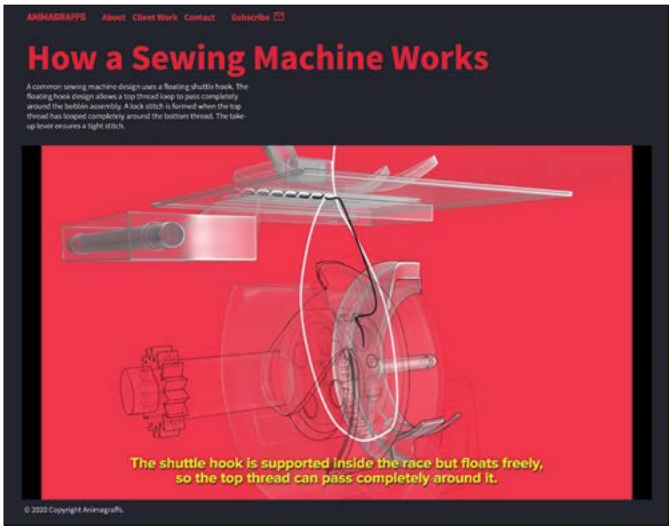


Figure 9. An Animagraffs animated illustration by Jacob O'Neal (2020) showing how a sewing machine works. Reprinted with the permission of Animagraffs by Jacob O'Neal.

Structural elegance and transparency assume new forms in contemporary technical illustrations in which animations create fluid and complex compositions that engage (and delight) audiences with their spatial dexterity. Figure 9, for example, shows an animation by Jacob O'Neal (2020) that illustrates the operation of a sewing machine. The composition of this animation is tight and focused as well as artfully arranged. As the animation progresses, the machine appears from a variety of angles, with the illustrations magically zooming in and out to explain various features—here, how a thread passes through the bobbin to create a stitch. The machine is shown both as a fully assembled object as well as in parts, with lighter lines showing its structure in the background. The movement around the machine, the detailing, the light and elegant drawing style, and the red background uncluttered by contextual details heighten the beauty of this device and elevate it aesthetically and rhetorically by clarifying and celebrating its operation.

Some Attributes of Beauty in Technical Communication

Based on the examples examined so far, we can begin to create an inventory of design elements in a given composition—of a page or screen, drawing, or chart—that evoke beauty. Elements like parallelism, balance, color, and detail are likely candidates, though by no means does a beautiful design have to embody any or all of these attributes. Many of the design elements in this tentative inventory are rooted in Gestalt principles and intertwined with Modernism and its emphasis on perceptual clarity (see Butler, 1984, pp. 30–31; Lupton, 1986, p. 51; Arnheim, 1969).

- *Parallelism* provides a key aesthetic element because it creates rhythm and consistency among design elements that create a sense of proportion, which has a longstanding association with beauty and has the uniformity and perceptual comfort that Burke describes in his *Philosophical Enquiry*. Parallelism can take many forms: graphical elements like bullets, rules, shaded boxes, and borders; a set of abstract icons on a desktop menu, bars on a chart, color coding on maps, or a series of instructional drawings with the same style, size, color, and framing. Organizational charts, like

the one in Figure 8, embody graphical parallelism in the boxes representing key personnel: the repetition and alignment of these forms, their shading, and the lines connecting them.

- *Balance* (or compositional symmetry) also provides a means for achieving beauty, primarily as a pure form of proportion touted by ancients like Vitruvius. As Burke claimed, viewers find smooth and subtly curving forms (like circles) attractive, examples of which appear in the machines in Figures 2, 4, 7, and 9. Distributing elements evenly across a page or screen can create a similar effect, as one textual element or image balances and complements another in a given composition. The façade in Figure 1 illustrates this compositional balance, as does the wood framework of the weaving apparatus in Figure 3 and the distributed images in Figure 5. In its most extreme form, of course, balance can devolve into gray matter, which becomes sedate and disengaging. So we also need focal points to keep us alert and engaged: drop caps, pulled quotes, spot color, high-contrast images, and the like.
- *Fine descriptive detail* is yet another manifestation of beauty. Burke associates beauty with "delicacy" (p. 116), and the exquisite details of a three-dimensional picture of a designed building, like the Italian villa in Figure 1, give audiences a realistic idea of what it looks like in its environment, complete with trees, landscaping, and people inhabiting the space. Ramelli's water pump (Figure 2) and the paper-cutting machine (Figure 4) also visualize fine details, as do the steam engine (Figure 7), organizational chart (Figure 8), and the sewing machine animation (Figure 9). This vivid description (or enargeia) fosters an emotional response (see Kostelnick, 2016), and the intricacies of such drawings can both delight and dazzle us.
- *Color* is frequently associated with beauty and aesthetics: pure, bright hues (not flattened with grayscale) evoke beauty, as do colors that are blended harmoniously (see Richards & David, 2005). Perhaps more so than other forms of beauty, colors play on our senses, like the turquoise in the OSHA organizational chart (Figure 8) or the red shirt in the nail gun instructions (Figure 5) that emphasizes the safety message. In both cases, color enhances usability and persuasion. On the other hand, color that beautifies a design might also weaken its functionality: On a chart or graph, complementary colors that are calm and pleasing to the eye, and that heighten ethos and elicit pleasurable emotions, might be a better choice than gaudy, high-contrast colors that more clearly and emphatically differentiate the data.

Although deploying design elements like these can help us visualize beauty, we can also identify composing practices that veer us in the opposite direction: multiple typefaces in close proximity, a lopsided distribution of visual elements on page or screen, visual patterns that resonate awkwardly (e.g., moiré effects), colors that clash with one another, and unedited details like misaligned lists, orphans and widows, and unfocused or pixelated images. Whether we are willing to admit it or not, avoiding these involves some aesthetic judgment in our quest for utility.

Empirical Measurements of Beauty

If visual elements in technical communication can, at least to a degree, also be considered an art form, how can their effects on audiences be measured? Numerous researchers have empirically studied subjective aspects of visual language, from typography to data design. In his foundational studies of typography, for example, Ovink (1938) studied the "atmosphere value" of typefaces by measuring the subjective emotions that readers associate with them (see also Brumberger, 2003). Tinker and Paterson (1942), moreover, measured the "pleasingness" of typefaces (what people like or prefer) and found a strong correlation between what readers find pleasing and what they perceive to be legible (see also Tinker, 1963, pp. 49–51, 72–73, 79, 117–118, 121–122; Burt, 1959, pp. 18–29). In the realm of data design, Bateman et al. (2010) found that participants in their study preferred charts with pictorial elements and had better long-term recall of them over plain charts. Furthermore, in her study of color schemes in PowerPoint charts, Jo Mackiewicz (2007) found significant variation in their "attractiveness" to participants.

Usability studies, moreover, also acknowledge aesthetics by often identifying what readers find appealing and what draws them to a communication in the first place. Two foundational studies illustrate this process: In creating educational materials on child development for low-income families, Michael Floreak (1989) and his team sought input about parents'

preferences for illustrations before creating a new design; in re-designing a telephone bill, Keller-Cohen, Meader, and Mann (1990) measured the audience's preferences for the original design relative to the re-designs. Many studies since these, including those by Karen Schriver (1997), affirm the importance of audience preferences in assessing feedback during the design process. Today, methods of "preference testing" for "aesthetic appeal" can be applied to virtually any design and can be measured both quantitatively and qualitatively (UsabilityHub, 2020). In short, then, what audiences generally find pleasing—judgments based in part on aesthetic criteria—affects how (or if at all) those audiences interact with and interpret a design.

Aesthetic preferences have remained a major factor in usability studies, including those of UX design. For example, Lavie and Tractinsky (2004) measured users' perceptions of websites based on "classical aesthetics," which mirror traditional standards for beauty (similar to those I discussed earlier), and "expressive aesthetics," which exhibit creativity and novelty. Although users in the study responded positively to both forms of aesthetics, Lavie and Tractinsky found that users clearly associated "classical aesthetics" with usability (pp. 286–290), confirming traditional standards for beauty. Given that audiences consider aesthetically pleasing Web designs as more usable, aesthetic judgments can provide valuable input, especially when they are solicited after "behavioral" testing (Whitenton, 2017). In short, aesthetics are playing an increasing (and surprisingly important) role in gauging user experience with empirical methods. Although we might be skeptical of methods that measure subjective aspects of design like aesthetics, preferences, and pleasure (which are all intertwined), empirical studies of subjective and emotional factors are conducted routinely in cognate fields like marketing and psychology. Doing so in our own field should have equal validity.

CULTURAL INFLUENCES ON AESTHETICS: A CATALYST FOR VISUAL CONVENTIONS

Designing and interpreting the many forms of visual language I've described so far rarely happen in a cultural or aesthetic vacuum. The aesthetic aspects of visual language also reflect larger cultural processes beyond the control of individual designers by embodying conventional codes that accrue from the shifts in taste from one historical period and design movement to the next (Eco, 2004, p. 12; see also Brasseur, 2003). These culturally based codes are often deeply embedded in our development and education from an early age (Kazmierczak, 2000/2001, pp. 178–180), and they encompass all aspects of design, including screens and interfaces (Reinecke & Bernstein, 2011). Culture has a ubiquitous presence in information design, as visual language conforms to the dominant aesthetic styles of a given era and place to meet audience expectations: A millennia ago, for example, Chinese medical drawings were made more credible and persuasive when they were deliberately adapted to the prevailing aesthetic tastes of the upper class and "scholar-officials" (Zhang, 2016). Today, however, aesthetic conventions constitute an invisible practice that is so pervasive and foundational that designers and their audiences enculturated in those conventions might not even acknowledge their presence.

So how, exactly, and in what form, do these larger aesthetic developments influence designers of practical communications, who may have no affiliation with a design movement or even a grounding in its visual principles? One way to answer these questions is to consider the relationship between the fine and applied arts, and culture more broadly, and how they overlap or interweave with each other.

Changes in taste driven by cultural forces permeate all areas of design—from drawing and painting to architecture and product design—as well as visual forms of practical communication like text design, illustrations, and data visualization. For example, page design from the medieval period to the present has been closely aligned with the cultural and spiritual values of a given era, as Western culture moved from the "point-based grid" of the medieval world (Williamson, 1986, pp. 15–18), immersed in Christian symbolism, to the more secular worldview of the Renaissance and Enlightenment, based on reason and Cartesian geometry (Williamson, 1986, pp. 18–21), to the modern grid based on modular design principles (Lupton, 2004, pp. 121–129), which were also applied in architecture and interior design. Similarly, pictures have reflected the aesthetics of a given era, beginning with the Renaissance and early engineering drawings (Figure 2) and continuing into the Enlightenment (the *Encyclopédie* drawing in Figure 3) and the Romantic and Victorian eras (Figure 4). Even data design has

assimilated the values of larger aesthetic movements, as we'll see. In fact, it's hard to imagine any visual elements in technical communication that haven't imitated (or echoed) the visual arts or been influenced by the cultural forces that shape (and reshape) them.

Sometimes these connections between culture and design can, ironically, be seen more clearly from a distance. To explore these connections, I'll examine some nineteenth-century artifacts, then consider the shift to Modernism that followed. Visualizations of information in the later nineteenth century paralleled the aesthetic values of the Victorian period. For example, the image in Figure 10 from the U.S. Patent Office (1892) illustrates farming technology in an American landscape—here, an early implement for mechanically harvesting grain. Powered by a team of horses, the harvester relies on the movement of the wheels, connected to a belt, to set the apparatus in motion as it moves across the field, guided by the operator standing on the back. The setting in which this machine functions epitomizes American rural life in the nineteenth century, with a lone farmer ensconced in nature and operating freely and independently. His private domain clearly defined by the distant fences, this solitary agent dwells in a Romantic scene envisioned in the writings of Thoreau and Emerson, the idealized paintings of Thomas Cole and the Hudson River School, and the popular rural scenes of Currier and Ives. The style and setting of this drawing, along with the robust agency of the figure, integrate the cultural values of the historical moment to create a persuasive statement about the benefits of emerging technology.

Victorian design was also characterized by a plenitude of details, like the ornate neo-Gothic façades found in nineteenth-century hospitals, libraries, schools, and college buildings as well as in Victorian houses replete with towers, slender columns, elaborate trim, and stained-glass windows. The nineteenth century was also the age of Realism, in both literature and art (e.g., Dickens, Flaubert, Millet, Winslow Homer), which emphasized fidelity to minute particulars. That attention to detail, already evident in the paper-cutting machine in Figure 4, can be seen to an even greater degree in Figure 11, a technical drawing of a mechanical device for controlling the speed of a steam engine that generates electricity (Durham's Governor, 1882). Here, the gears and other external components are illustrated in precise detail, with full shades and shadows to enhance their realism. To provide yet more descriptive detail, a cross-section of a gear appears on the right, and an elevation appears on the left. Both of these smaller drawings, which float in mid-air, are arranged to create an efficient—and aesthetically pleasing—composition. Intricate and balanced, with fine, smooth-flowing linework, this drawing embodies both the aesthetics of the Victorian era as well as the more universal attributes of beauty I defined earlier.

This same Victorian sensibility pervaded charts and graphs in the later nineteenth century. Data displays during this era, sometimes referred to as the "golden age" (Funkhouser, 1937, p. 330; Friendly, 2008) of data design, incorporated creativity, complexity, and lavish detail and color. For example, Figure 12 shows a rank chart from the 1898 *Statistical Atlas of the United States* (Gannett & United States Census Office, 1898) that plots the relative sizes of U.S. cities over a century Not surprisingly, New York and Philadelphia held prominent places at the top of the charts for decades, with newcomers like Chicago and San Francisco rapidly gaining ground. The vivid colors in the symbols representing the cities, the intricacy of these symbols, the network of sloping lines connecting them, and the sheer complexity of the display (visualizing a century of census data) exemplify the aesthetics of the period. Embodying the cultural values of its era, this chart drew

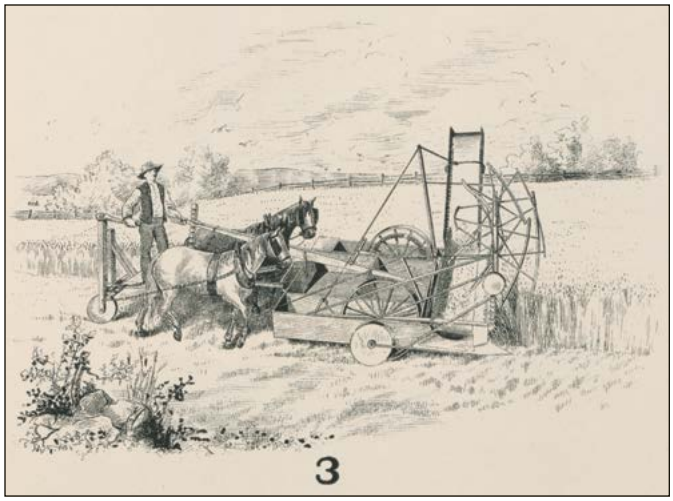


Figure 10. Nineteenth-century drawing of a reaping and thrashing implement situated in an American rural setting (U.S. Patent Office, 1892, p. 17, Figure 3). Courtesy of Iowa State University Library Special Collections and University Archives.

from the same rich pool of aesthetic tenets that inspired the Victorian façade.

A similar emphasis on intricate detail appears in many other forms of practical communication of the period: the delicate, natural style of handwriting with its emphasis on contrasting thick and thin strokes; page borders with elaborate vegetative swirls; and graphical elements like the "north" symbols on engineering and architectural drawings, their intricate arrows mimicking the finials atop a tower or church spire (see, for example, Esser, 1877, p. 27). The aesthetic sensibility that generated these exquisite embellishments rippled through all forms of design, large and small, right down to the pen and inkwell.

This Victorian penchant for profuse detail and ornament met strong resistance with the advent of early twentieth-century Modernism. Fostered by the emerging industrial culture and a reaction to excessive Victorian ornament, this new approach to design generated a set of design principles based on functional minimalism, high-contrast geometrical forms, and perceptually based concepts (e.g., contrast, focal points), many of which still largely dominate design today. The synergy between aesthetics and functionalism, between form and function, was epitomized in the Bauhaus design school in Germany in the post-World War I era of the 1920s and early 1930s, particularly with the typographical designs of Moholy-Nagy (Craig & Barton, 1987, p. 163) and other early Modernist designers like architect Walter Gropius (see Kostelnick, 1990; Banham, 1960; Kinross, 1985). A similar

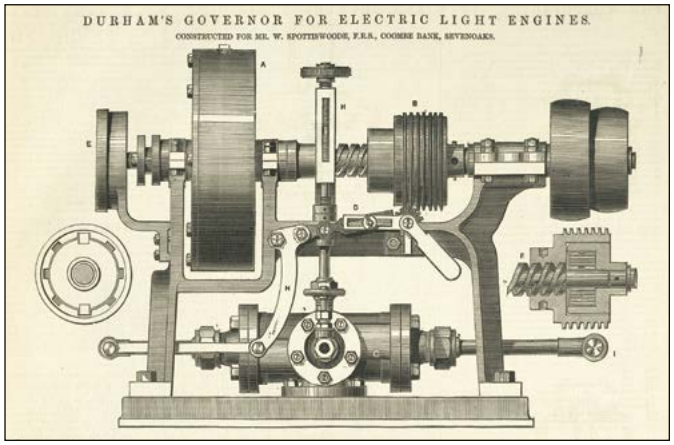


Figure 11. Detailed drawing from *The Engineer* of a mechanical device for an electric light engine (Durham's Governor, 1882, p. 215). Image used with permission of *The Engineer*.

functional Modernism appeared in Otto Neurath's Isotype (1936, 1939) with its geometrical, high-contrast forms used to display pictorial symbols and quantitative data, a design method that was brought to the US by Rudolf Modley (1937; see Crawley, 1994).

Figure 13 shows a Modernist design from the U.S. Federal Emergency Relief Administration's report *On Relief* (1935), which visualizes data about the plight of American workers during the Great Depression, especially those unemployed and receiving government assistance. The design emulates Neurath's Isotype principles with its stylized, high-contrast icons that embody simple geometrical forms at a high level of abstraction. Epitomizing the new machine-age aesthetics, these pictographic icons—which represent people and resources—flow across the chart like reproducible objects on a factory assembly line. The sans serif text and use of black and red (a primary color) further exemplify Modernist aesthetics and contrast starkly with the decorative excesses of the Victorian age. In this unassuming but perceptually potent display, aesthetics and functionalism are inextricably wedded!

Today, the influence of Modernist aesthetics continues to ripple through contemporary information design, with its emphasis on lean functionalism, modulated by the design affordances and perceptual ecology of digital media. The chart in Figure 14, from the U.S. Census Bureau's online Library of Infographics & Visualizations (2019), reveals the contemporary aesthetic of the digital infographic, here in the form of horizontal bar charts displaying popular occupations of male and female workers. The sans serif title and labels, muted colors, and silhouettes of human forms contribute to the light and airy composition. Unlike the flat, subdued bars atop this chart, the human forms standing beneath the plot frame have variation and depth, visualizing a highly inclusive workplace without revealing specific identities. The charts in Figures 13 and 14 both artfully display data about people and their relationships to work, but they are differentiated by the aesthetics of Modernism and its later-stage (Postmodern) digital incarnation.

At a given moment, these visual manifestations of aesthetics were probably so familiar that they remained invisible to their audiences and designers, deployed as part of the cultural conventions of the period—and re-deployed and interpreted without much deliberation or critique. However unknowingly this process unfolds,

information design remains constantly permeable to cultural influence, which both enhances the engagement and efficiency of audiences and strengthens the credibility and persuasiveness of the designs.

ART AND THE CREATIVE PROCESS: A SYNTHESIS OF CONVENTION AND NOVELTY

The cultural knowledge embedded in visual aesthetics operates silently, even indiscernibly, as technical communicators deploy visual conventions—text, images, data displays—to meet audience expectations and streamline their design processes. At the same time, designers need leeway for creativity and novelty as they adapt visual elements to specific rhetorical situations. The perpetual tension between convention and novelty (see Butler, 1984), then, creates something of a conundrum when considering the role of aesthetics in technical communication: On the one hand, the aesthetic values of a given historical moment have a strong (and irresistible) influence on design, and on the other hand, designers need the freedom and agency to inject aesthetic elements of their own into a given communication. We might plot these tendencies on a spectrum:

Convention ◄——————————► Novelty

Christopher Alexander explained this tension between convention and novelty in his *Notes on the Synthesis of Form* (1964), the manifesto of the Design Methods Movement, in which he describes "unselfconscious" and "selfconscious" cultures (p. 32). "Unselfconscious" cultures adhere to longstanding conventions (pp. 33–36), while "selfconscious" cultures are more invested in dynamic, innovative problem-solving in

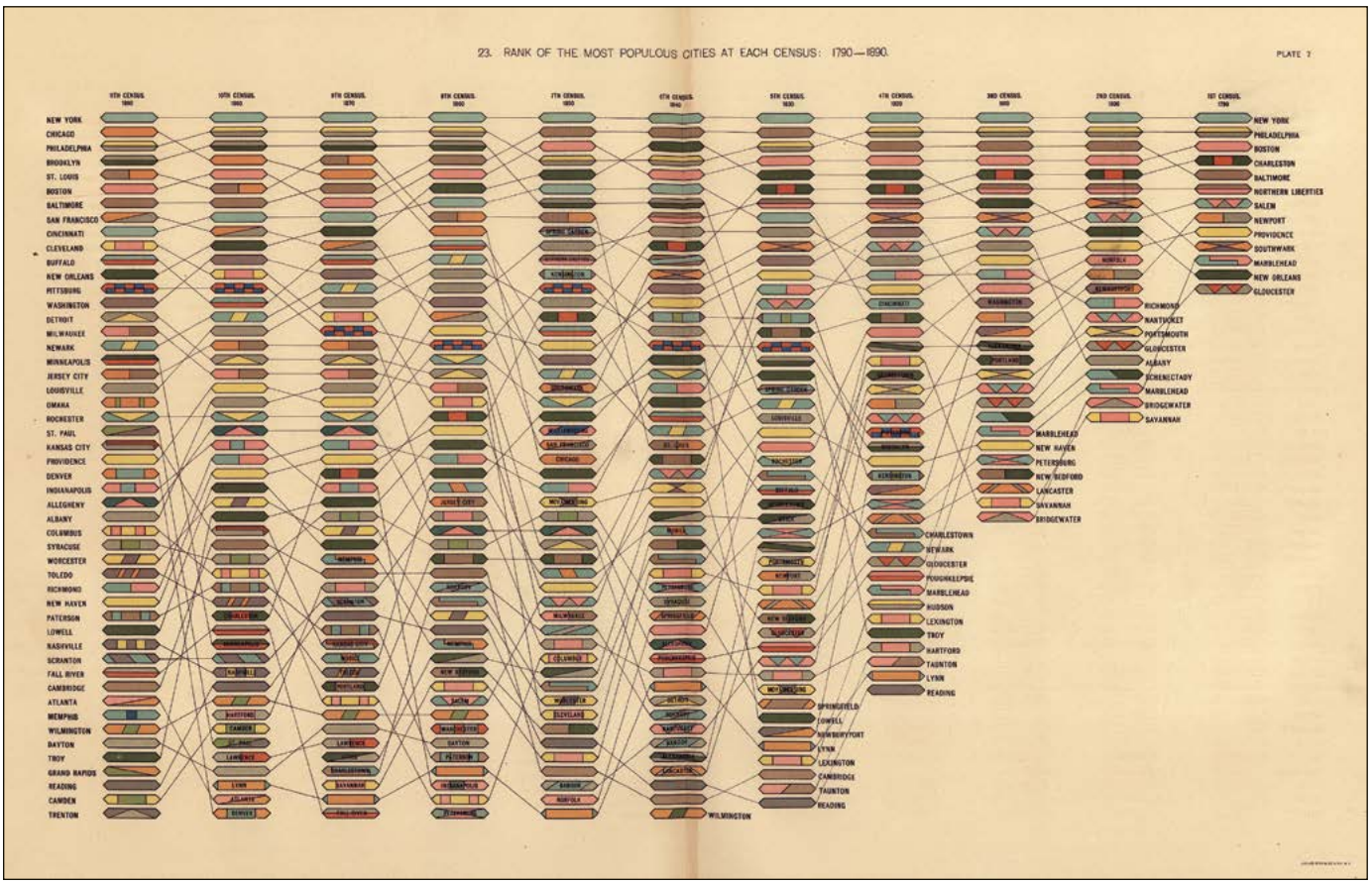


Figure 12. Chart from 1898 *Statistical Atlas of the United States* showing the variable ranking of cities from 1790 to 1890 based on population (Gannett & United States Census Office, 1898, Plate 7). Courtesy of the Library of Congress, Geography and Map Division [07019233].

which in-depth analysis of the problem drives the design process (pp. 55–83). Although Alexander doesn't address the role of beauty or aesthetics, his theory relates to practical visual communication in that designers can be considered working in an "unselfconscious" way when they routinely (and without much deliberation) integrate aesthetic conventions into their work. On the other hand, designers working in a "selfconscious" mode invent aesthetic elements for a particular design and situation, pursuing novelty to reach their rhetorical goals.

Visual Invention: The Pursuit of Novelty in Modern Design

To the extent that designers maximize their agency and gravitate toward novelty and visual invention, how does this process unfold? How do researchers and theorists explain the role of creativity in the design process? Although these complex questions don't have simple answers, researchers and theorists have been studying them for some time, with mixed and sometimes contrary results. In his seminal study *The Act of Creation*, Arthur Koestler (1967) identifies "bisociation" as the key factor, whereby disparate elements are brought together in new ways (pp. 35–38, 352). So a designer might intermix color, type, and images to create an innovative website; draw an illustration that blends realistic and abstract elements; or construct a hybrid data display that combines genres—say, bar charts on an interactive map. Although these novel designs might challenge audiences initially, they might also be more inviting, useful, and persuasive.

What role does artistic inspiration play in creating artful, novel designs? Karen Schriver (1997) critiques the "romantic" approach to design in which an ineffable inspiration guides the creative process of the designer, who remains largely detached from the needs and feedback of the intended audience (pp. 82–84). This "romantic" approach to creativity implies that we can't comprehend how designers generate ideas, that creativity is something innate and mysterious, an idea that originated in the Romantic movement (in the later 1700s and early 1800s) and its deep belief in the creative powers of the imagination.

This intuitive notion of creativity, however, was contested in the 1960s and 1970s by the Design Methods Movement, which advocated a more explicit and rational approach to design (Jones, 1963; Alexander, 1964; see Kostelnick, 1989), similar to how engineers and scientists solve complex problems. According to Christopher Jones (1970), one of

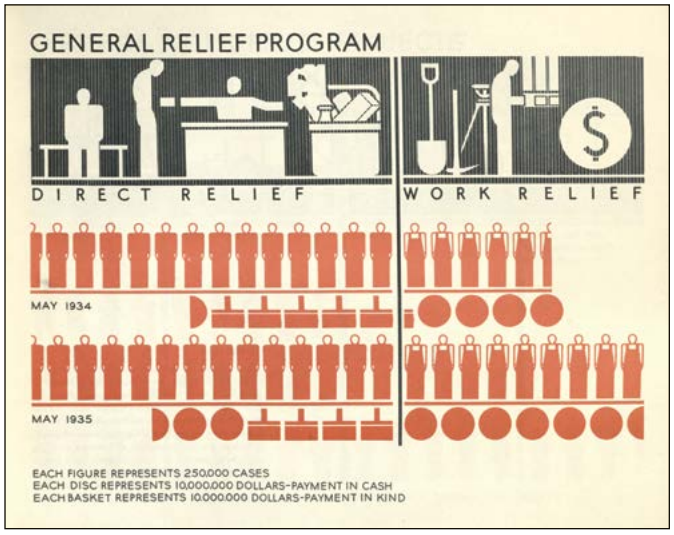


Figure 13. Modernist chart from *On Relief* showing data about the U.S. Government relief funding during the Great Depression (U.S. Federal Emergency Relief Administration, 1935, Chart XII). Courtesy of Oregon State University Libraries.

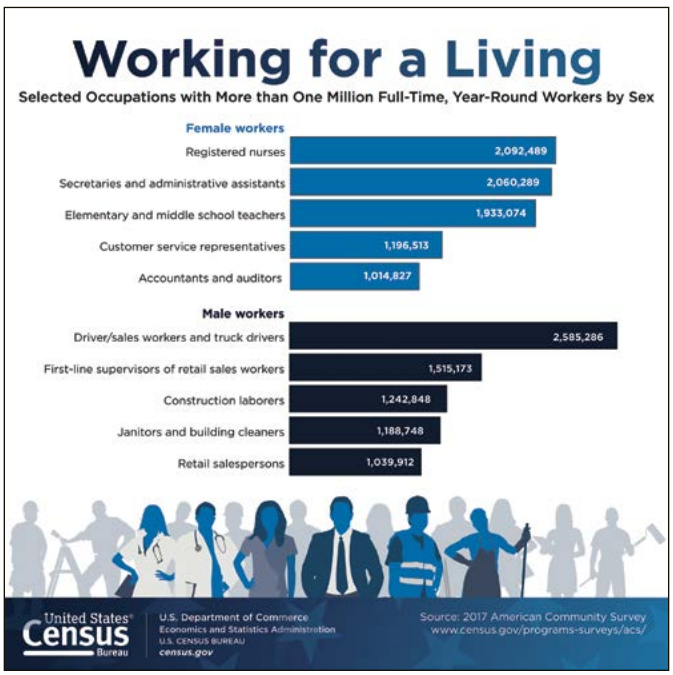


Figure 14. Online chart from the U.S. Census Bureau website showing data about occupations by gender (U.S. Census Bureau, 2019).

the founders of the Design Methods Movement in architecture, the goal of the "new methods" was to "make public the hitherto private thinking of designers; to *externalize* the design process" (p. 45), to demystify it by transforming the "black box" into a "glass box" (pp. 46–56). In this new paradigm, design was described as a transparent process consisting of "Analysis," "Synthesis," and "Evaluation" (Jones, 1963, pp. 54–55; Jones, 1970, p. 50), with the analysis stage holding the key. Consequently, methods for solving design problems could be controlled and replicated, even if the problems varied considerably, as is the case with architectural design where buildings serve their users in many different and often unique ways (Alexander, 1964).

Whether we conceive of the design as a mysterious and innate or as an explicit and replicable process, how can nondesigners learn to think like designers? How do instructors encourage design as a way of thinking? To answer these questions, Eva Brumberger (2007) suggests a variety of strategies, such as teaching design as a process, encouraging students to sketch ideas and to integrate words and images, and creating a "studio" setting that provides a space conducive to creative and collaborative design (pp. 385–390). Several additional techniques for stimulating visual creativity appear in Brumberger and Northcut's *Designing Texts: Teaching Visual Communication* (2013)—among them a low-tech "natural" approach to enhance individual expression (Kostelnick, 2013). Envisioning a more collaborative, interactive method, recently several proponents of "design thinking" (Pope-Ruark et al., 2019) have advocated a pedagogical approach in which students create information products by actively consulting with their users. This participatory process disperses invention across both designers and their audiences while embracing the interactive affordances of contemporary digital design.

Novelty and Convention Combined: Aesthetics in Interactive Data Design

In virtually any communication, novelty and convention are, to varying degrees, integrated to produce aesthetically appealing designs; these two coalesce in especially striking forms in contemporary data visualization. With the invention of digital tools for charting, graphing, and mapping data, the field of data visualization has exploded, both in the number of visualizations and their complexity and popularity, with numerous online archives and international awards recognizing creative, exemplary, and *beautiful* designs (see McCandless, 2020; Kantar, 2020). These innovations continue to multiply as more designers acquire the skills to transform data into useful works of art, pursuing novelty while working primarily within the conventional visual language of traditional genres (bar and line graphs, scatterplots, maps, and area charts). Aesthetics play a key role in this creative process, as designers deploy forms that evoke beauty and enable users to personalize the data, which stimulates the emotions and makes the experience more pleasurable (see Kostelnick, 2016). Combining the two—by creating graphical beauty and inducing user interaction—engenders the "information aesthetics" described and modeled by Lau and Vande Moere (2007).

Figure 15 shows a visualization blending data and beauty in the form of a complex interactive map of "How the U.S. Generates Electricity," which appears on the Carbon Brief website (Evans & Pearce, 2017). This display visualizes the various sources of power—both renewables like wind, solar, and hydroelectric as well as carbon-based sources like oil and gas—across the US, with the size of the circles (bubbles) indicating the relative energy generated by the power sources. So what makes this chart, and other data visualizations akin to it, beautiful? The surface aesthetics certainly contribute: the vibrant array of colors, the pervasive circles (smooth, symmetrical forms that Burke associates with beauty), and the intricacy of composition. But beyond those, the interactivity of the chart personalizes the experience by allowing users to choose data based on their interests and geographical locations. For example, users can zoom in on a particular state or select an energy source as well as mouse over a given source for textual details. These interactive features were carefully planned by designer Rosamund Pearce (2018) to give users maximum flexibility to explore the data and thus make their experiences successful and engaging. That interactivity, which personalizes the data exploration, and the exquisite graphical coding, which elicits pleasurable emotions, enhance the "information aesthetics" of this display, beautifying the data and heightening its rhetorical effectiveness and impact.

CONCLUSIONS: FROM THEORY TO PRACTICE

Art and aesthetics have inundated design for centuries, and they continue to do so today with an ever-increasing variety of visual forms. Designers should acknowledge these visual elements in their work and routinely deploy them to meet the goals of their communications, whether those elements take the form of conventions generated by larger cultural forces, design principles intended to foster beauty, or sheer novelty. In recommending these actions, however, I'm not suggesting that technical communicators try to transform themselves into artists (or graphic artists) or that they radically change their approach to designing pages, screens, pictures, or charts and graphs. In most situations, designing technical information primarily for aesthetic impact isn't realistic or desirable: Most

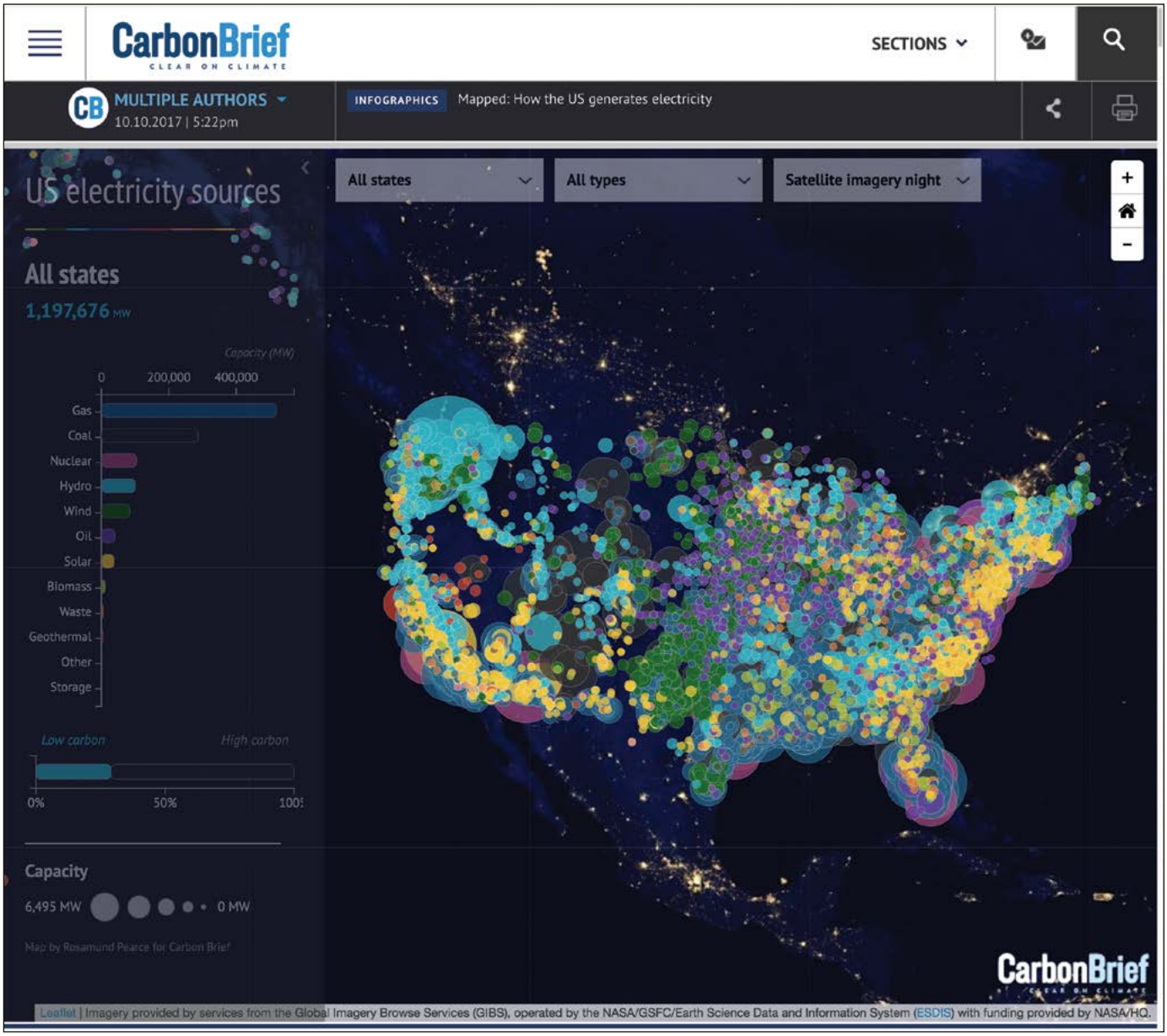


Figure 15. An interactive map on the Carbon Brief website showing the sources of electricity across the U.S. (Evans & Pearce, 2017). Reproduced from Carbon Brief with permission. https://www.carbonbrief.org/mapped-how-the-us-generates-electricity

rhetorical situations just don't warrant it, and an excessive attention to art and aesthetics can devolve into perceptual distraction and impede usability.

On the other hand, designing without any aesthetic elements or judgment leaves some important rhetorical cards on the table: engaging audiences in the communication, appealing to their emotions, persuading them and building credibility with them, and meeting their expectations about what looks conventional and appropriate. Besides, designing information that delights and pleases audiences can rarely be regarded as a liability rather than a benefit. And despite the inherently slippery and subjective nature of aesthetics, the preferences of audiences for what they find attractive and pleasing can be measured and quantified and productively funneled into the design process. And, not the least, an attention to aesthetics fosters creativity, one of the aspects of technical communication that makes it human and satisfying, to both designers and audiences alike.

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Uncommonly Common: Reconsidering Creativity and Beauty in Technical Communication

By Kathleen Sandell Hardesty and Andrew Hollinger

ABSTRACT

Purpose: In this article, we (re)consider the moments of creativity and beauty in the work of technical communication and how those moments can be better incorporated into, emphasized, explored, and engaged with in classroom instruction or other training.

Method: We performed a literature review of texts published in the last 25 years, identified by searching for the keywords "creativity" and "beauty" in technical communication journals, to understand how these concepts have been theorized and included in the field recently. We then extended this prior literature to consider how beauty and creativity might be incorporated into technical communication teaching/training. The suggestions offered are grounded in experiences, observations, and student feedback from our own classrooms and training, and/or from other classroom studies and additional literature from the field.

Results: We identified creative approaches that help students and practitioners think more intentionally about audience, purpose, and visual elements in technical communication. These approaches reinforce (rather than distract from) established principles of technical communication. We offer practical solutions for instructors and trainers who are intrigued by more creative techniques but may, for various reasons, consider artistic elements inappropriate or unworkable in their classrooms.

Conclusion: Fostering an appreciation for creative and beautiful communication in the classroom helps develop more effective technical communicators. Especially considering that the ways audiences encounter and interact with information have been changing rapidly, technical communicators must be able to think and create both visually and spatially, as well as connect with users on a human level.

Keywords: technical communication, creativity, beauty, visual design, multimodality

Practitioner's Takeaway:

- Instructors and trainers should seek the teachable moments of creativity and beauty in the study and practice of technical communication.
- Students and practitioners need to reframe both themselves and the work they do as technical communicators to embrace the beauty in the processes and products of technical communication.
- We propose courses that are highly multimodal, incorporating elements of visual design, remixing, and storytelling. We also encourage students to explore emerging genres and "unconventional" genres.
- Technical communication is the practical application of creativity and beauty in order to make "life easier and more productive." It is remixing to re-see.

> "When you can do the common things of life in an uncommon way, you will command the attention of the world."
>
> —George Washington Carver

Consider the map of the London Underground. The first official map, developed in 1908, is hardly readable (Figure 1). The text is tiny and tilts off at odd angles, and it is difficult to establish where a person can transfer from one train to another. It is a classic illustration of technical communication with good intentions but poor execution.

In 1933, Harry Beck, an engineer, developed the now-iconic map for the London tube system (Figure 2). Beck's design was so successful that it continues to inform the current Transport for London tube map, even as the system has expanded to new stations and lines (Figure 3) as well as the designs of subway/tube maps from all over the world. Beck's map is not simply good technical communication (with readable text and a clean layout); it is good design. Rather than follow the city streets or physical locations of the subway lines, as the 1908 map attempted, Beck's design suggests relationships and direction rather than distances or precise geographic locations. It is a map

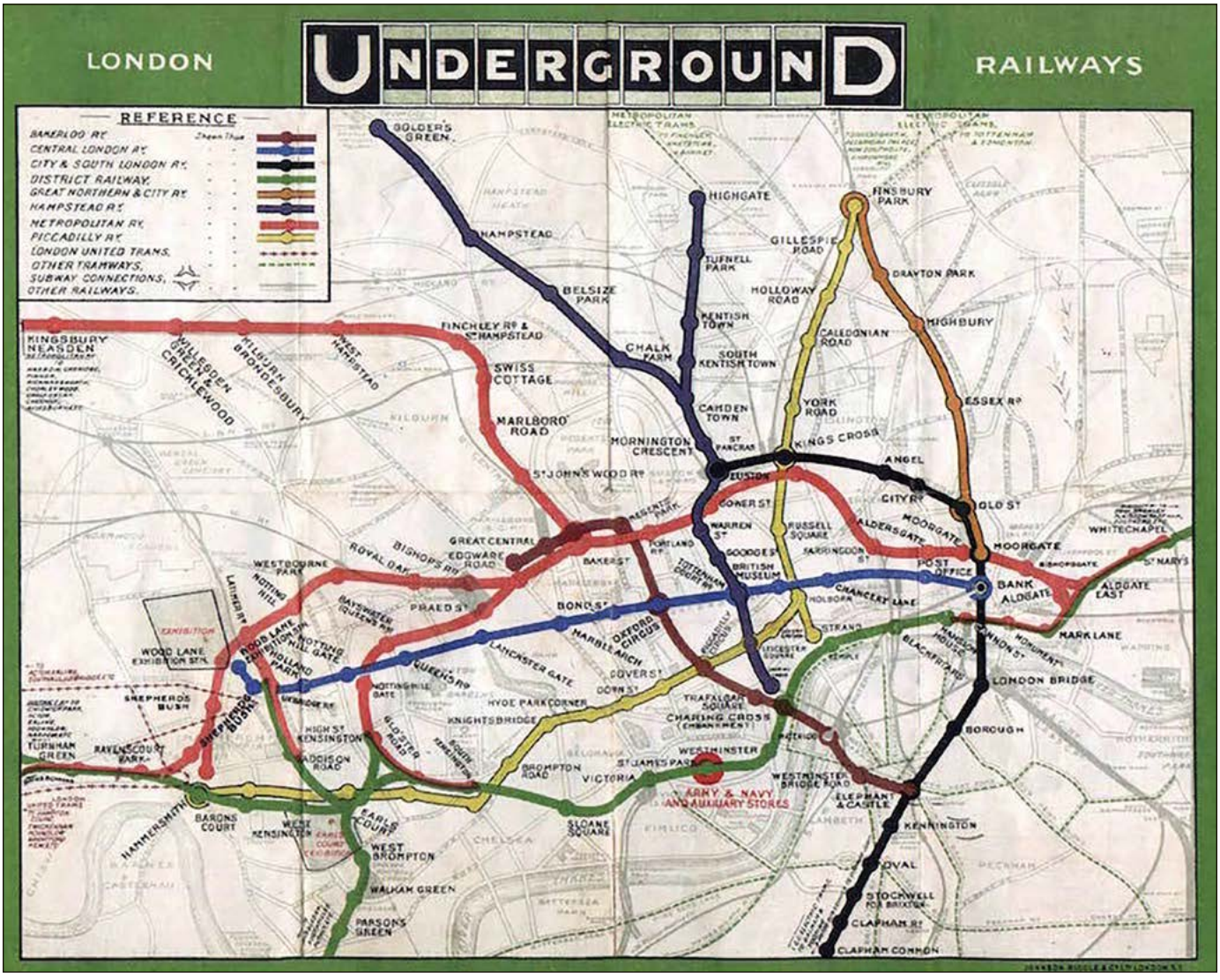

Figure 1. First official map of the London Underground (1908)

Creativity and Beauty in Technical Communication

about getting around—technical communication about using the technology. More than that, however, Beck's design is attractive. The map is balanced, and the lines, curves, hash marks, dots, and diamonds are bold and purposeful. The diagonals, horizontals, and verticals are striking and hint at movement. The map urges the reader toward travel. It is, simply, beautiful communication.

The map of the London Underground offers at least two important lessons for technical communication. The first lesson is that beauty is not separate from/of design. Beck did not develop a good map and then make it pretty. Beck's map is both effective and delightful at the same time. That is, good design is often also beautiful. The second lesson is about creativity. Although Beck's map feels familiar today, in 1933, the design was revolutionary. The move from traditional space/place/distance maps to relationship/direction maps required leaning into possibility rather than abiding the status quo, that which is common. Technical communication, then, can and should be a creative and beautiful endeavor.

Often, students come into our courses with the assumption that technical communication is not particularly creative; it isn't poetry, a short story, or a graphic novel. They expect coursework that is dry and tedious. Corporate training on technical communication is met with similar enthusiasm. Generally—and not necessarily unfairly—most people do not equate the work of technical communicators with art and beauty or anything creative. When asked what technical communication is, a common response from both students and corporate employees is to rattle off various work products like reports and manuals.

Figure 2. Harry Beck's revised tube map of the London Underground (1933)

Their expectations for the course or training are often to learn how to produce these various genres effectively in the workplace (which is a fair and worthy goal). However, we have not had a student or trainee yet who, on the first day, looks forward to the creativity involved with technical communication, much less making something beautiful.

As instructors and technical communicators, we approach our courses and training, however, with the belief that anything created is a creative pursuit. The art is there, though how is not always immediately obvious. Students and practitioners need to reframe the work they do as technical communicators to embrace the beauty in the processes and products of technical communication. Our questions, then, as we develop our courses and the materials that guide students and employees through technical communication content are: What are the moments of creativity and beauty in the work of technical communication, and how can those moments be better incorporated into, emphasized, explored, and engaged with in classroom instruction or other training? How does fostering an appreciation for creativity and beauty in the classroom then develop more effective technical communicators?

We begin by offering an overview of the literature published in the last 25 years, identified by searching for the keywords "creativity" and "beauty" in technical communication journals, to understand how these concepts have been theorized and included in the field recently. We then extend this literature review to

Figure 3. Current tube map of the London Underground

discuss ideas for integrating creativity and beauty into technical communication instruction and training, including some examples from our own courses, as well as from other classroom studies and insights from additional literature in professional and technical communication. While arguing for the importance of infusing beauty and creativity into technical communication instruction, we hope to offer practical solutions for teachers and trainers who may, for various reasons, consider artistic elements inappropriate or unworkable in their classrooms. We suggest that beauty and creativity reinforce (rather than distract from) established principles of technical communication.

WORKING DEFINITIONS: TECHNICAL COMMUNICATION, CREATIVITY, AND BEAUTY

Technical Communication

We pause here to consider how we use our key terms—technical communication, creativity, and beauty—to reconsider the role of technical communicators. Like many terms, the definition of technical communication and its goals often vary from person to person. Generally, our students or those we train view themselves by their intended/current occupations rather than as technical communicators. They see themselves as (future) teachers, occupational therapists, computer scientists and programmers, business owners, managers, engineers, and so on. The titles of our courses and workshops, too, can contribute to definitional drift. The theoretical and practical difference between courses called "technical communication," "technical writing," "professional writing," "professional communication," and "technical and report writing" (all courses that have been offered at our institutions, sometimes in the same semester) is often blurred. This ambiguity is compounded when various programs that require a technical communication credit accept any of the above-named courses to meet this requirement.

The Society for Technical Communication (STC) defines the field broadly to include any form of communication about technical or specialized topics, communication that uses technology, and/or communication that provides instructions about how to do something. While job functions can range from technical writers and editors to illustrators, designers, and Web developers, according to STC, "What all technical communicators have in common is a user-centered approach to providing the right information, in the right way, at the right time to make someone's life easier and more productive" ("Defining Technical Communication," n.d.). In reconsidering and reframing the work of technical communicators, we particularly focus on this "human element" in technical communication—on not only the ability to improve, inform, and clarify, but also to move, inspire, and connect on a human level. Our understanding of technical communication includes any artifact, process, or product whose use, documentation, and implementation can be designed to be as useful as possible. That is, as we hope to demonstrate in this article, our understanding of technical communication is necessarily and inherently creative and beautiful.

Creativity

There is something unnerving about creativity. Perhaps it stems from the persistent misconception of the left brain and right brain separating logical and creative functions. Or perhaps the dread over creativity begins much earlier, in elementary school, as students discover their drawings, stories, and poems are not as interesting (or at least not as applauded by the teacher) as other students' work. Or maybe the anxiety about being labeled a creative person emerges from a fear of having to produce something creative or innovative on demand: be creatively productive now (your job, performance review, raise/promotion, assignment, grade, honor/award depend on it!). The comedian Mike Birbiglia, for example, tells a story about his doctor requesting that he "say something funny" in the middle of a physical exam (Skidmore, 2017). Some may even perceive creative endeavors and occupations as unprofitable and therefore not worth pursuing. We suspect, though, that a combination of social and environmental factors makes creativity and being creative a panic-inducing proposition.

Standard dictionary definitions of "creativity" might link the term to imaginative pursuits or specifically to the production of original and/or artistic works. In relation to the everyday work of technical communication, however, we emphasize the generative, "making" function of creativity. Don Norman reminds us that "design is a powerful equalizing tool: all that is needed is observation, creativity, and hard work—anyone can do it" (2013, p. 296). In this

sense, drafting a blueprint, mapping a subway system, writing instructions, developing Web content, or even completing an activity report is as much a creative pursuit as painting a portrait or writing a poem. But creativity is also not limited to work products. Creative approaches are key to planning efforts, gathering information needed to develop content, developing processes to manage technical communication projects, and devising solutions to workplace problems. Art and beauty can be found in the process of making something new, whether for science, engineering, literature, music, or the creative pursuits of daily life.

Beauty

Discussions of beauty can quickly wax philosophical. Beauty is linked to physical, aesthetic, and emotional qualities, while it is also considered a product of formalized design principles like space, balance, and color. Beauty is corporeal, a sensation. Beauty is relative; some might say that beauty is something we "just know" when we see it. At the very least, beauty is hard to define. Often, however, students, practitioners, and communicators desire specific steps to ensure that they are making something beautiful. This section will move between both the philosophical and the practical in order to present an actionable definition of beauty/beautiful.

In our introduction, we suggest that Harry Beck's subway map is beautiful. Don Norman famously discusses the drawbacks of doors that were designed for "beauty, not utility" (Norman, 2013, p. 2). And of fancy faucets, he writes: "Yes, these new faucets are beautiful. Sleek, elegant, prize winning. Unusable" (2013, p. 152). In such a review, beauty might be seen as a detriment to usability or even an impediment to making life easier and more productive. Contemporary notions of beauty, too, often come with a caveat about vapidity or a lack of substance. We suspect that most (if not all) teachers have received some text or artifact largely without error that also, ultimately, lacked any substance, interest, or originality. Beauty without meaningful and material purpose is bluster. However, purpose without beauty is wayward.

Perhaps, taking a note from technical communication instruction, we can articulate beauty somewhat more pragmatically and actionably. We can consider again Beck's map and Norman's faucets together. The problem with the faucets, according to Norman, is that "they solved one set of problems only to create yet another" (2013, p. 152). Beck's map, on the other hand, reduced the number of problems and did so through taking risks (at the time) in terms of style, color, balance, and space/layout. A practical and actionable view of beauty might include purposeful design decisions (including, but not limited to, space, balance, layout, and/or color) that produce greater utility. This definition is not entirely—or even at all—satisfying. Beauty may be impossible to quantify and formalize as a set of universal processes, especially when elements like space, balance, layout, and color are components of visual rhetoric that may not have much utility within audio rhetoric (podcasts, spoken instructions, tele-help, etc.) and other less visually oriented artifacts. There is something about beauty and beautiful things. Most of us have had the experience of being suddenly taken aback by a sentence, photograph, song, performance, website, nature, another person, an act of kindness, and so on and struck momentarily silent by its abrupt beauty. To know and experience beauty but to be unable to formalize it into a rubric or steps is maddening.

Beauty and madness, though, do have a long, interrelated history. Plato's *Phaedrus* suggests that beauty both causes and soothes madness. For Plato, beauty is that which causes our souls, "stung in every part," to "[rage] with pain" (2001, p. 152). Then, upon "remembering the beautiful," our soul "rejoices" (p. 152), and "so because of these two mingled sensations, [our souls are] greatly troubled by its strange condition; it is perplexed and maddened" (p. 152). Further, it is beauty that causes one to "[despise] all the customs and proprieties in which it formerly took pride . . . for it [only] reveres [that which] possesses beauty" (p. 152). *Phaedrus* is not without its issues. For Plato, beauty is an ideal of form and performance, often equating beauty with attractiveness and inherent goodness, as with the tale of the good horse with his "clean limbs" and "aquiline nose" who is a "friend of honor joined with temperance and modesty, and a follower of true glory" compared to the other horse who is "crooked, heavy, ill put together," who is "the friend of insolence and pride" (2001, p. 153). This is difficult to read in 2020. Plato and *Phaedrus* do not exactly stand the test of time against our contemporary understanding of worth, ethics, and equality.

While *Phaedrus* is problematic, it may also be instructive. Questions about beauty and how it affects

us are an important part of our rhetorical history. Those questions continue to be relevant today: How much ethos does beauty continue to have? Might a more savvy and discerning contemporary audience still find beautiful things to also be good? What ethical considerations are then also wrapped up in making something beautiful? That we still do not have satisfying theories of beauty is telling, but Plato and *Phaedrus* may be able to point us in the right direction. When Plato first introduces the concept of beauty, he has Socrates say, "We know too that nonlovers [everyone] also desire[s] the beautiful" (2001, p. 144). The key between notions of the beautiful and a rhetorical theory that leads to practical technical communication choices is desire, which is "central to the practice of rhetoric—wanting something is a condition that impels rhetorical practice" (Gerdes, 2019, p. 231).

Kendall Gerdes (2019) argues that "to engage in rhetoric is to want something more than what is given, something else than what is given: to engage in rhetoric is to want a future" (p. 235). Gerdes suggests that the path from what is already available and known (that is, Aristotle's available means of persuasion) to what is possible (futurity) is desire. Hers is a rhetorical theory of invention and movement.

Beauty is not desire. But if we begin with Plato's idea (and our own anecdotal experiences) that we all desire the beautiful, even if we cannot agree on what is beautiful, we can begin developing an actionable process for delivering beauty. To move beyond Plato, it is helpful to quote Gerdes (2019) at length:

> A rhetorical theory of desire need not begin by defining desire or analyzing its origins; it can start by observing desire's rhetorical effectivity, its capacity or potential to open new rhetorical pathways, generate new lines of force, and make not only new arguments, but even new worlds, become available. (p. 238–239)

Without conflating beauty and desire, we can understand why beauty and the beautiful are an important part of the scholarly and professional discussion of technical communication. As an object of desire, seeking the beautiful is one way to generate new lines of force in our work, our work products, and our field.

There is some truth to the adage "beauty is in the eye of the beholder," though we advise caution here. Sometimes we fail to recognize something is beautiful (or a good example of its genre) simply because of our preferences. It is difficult to recognize beautiful operas, podcasts, or infographics if the beholder does not particularly enjoy those things. What we advocate for, however, is developing a point of view for integrating beauty into technical communication courses and artifacts, and a fundamental element of defining a point of view is that the user/designer/technical communicator develops it for themselves. We ask our students to cultivate and incorporate a sense of beauty, creativity, and design while they also reconsider their preconceptions of technical communication and its goals. Our courses require our students to develop a practical philosophy of technical communication that goes beyond utility and engages the user in delightful and surprising ways. To offer a pop culture example, during competitions, Food Network hosts often ask chefs what their point of view is because it will inform the kind of food they make, the way they present it, their relationship to the style of cuisine and the culture, and any message they hope their audience might receive. Chefs are technical communicators, and their medium is food.

For us, beauty is that element of our work—an artifact, a situation—that "impels rhetorical practice" (Gerdes, 2019, p. 231). Beauty moves. Beauty requires a response. In some ways, beauty is like Barthes's (1980) punctum, "that accident which pricks me (but also bruises me, is poignant to me)" (p. 27) except that instead of something incidental, beauty is purposeful poignancy.

CREATIVITY AND BEAUTY IN TECHNICAL COMMUNICATION

Calls for infusing creativity into technical communication instruction are not new. Yuejiao Zhang and Karla Saari Kitalong (2015) note that when creativity first emerged as a topic of interest in technical communication in the mid-1980s and early 1990s, the discussions centered on themes like using figurative language, poetic metaphors, and imagination (p. 199). But as technical communicators' roles have expanded, so has our understanding of the importance and function of creativity (Zhang & Kitalong, 2015). "Today's technical communicators are creative because they have the skills to invent

original solutions that address complex communication problems," write Zhang and Kitalong (2015, p. 199). More recent research related to multimodality, in particular, suggests that teachers and trainers should consider creative instruction that prepares students to navigate a wide range of genres, mediums, and eventual workplace challenges. In reflecting upon technical communication programs, Eva Brumberger (2007) notes that "if programs produce students who can think verbally but not visually, they risk producing writers who are visual technicians—writers skilled in visual tools and techniques but lacking...the ability to move fluidly between and within modes of thought and communication" (p. 378). Teaching and training in multimodality work hand-in-hand with encouraging creativity as essential in technical communication. By using a multimodal pedagogy, students will not only become more visually literate but will also develop the creative skills to more effectively produce various document types and solutions in diverse contexts for different audiences and purposes.

Using the specific example of teaching engineering students, Joseph Jeyaraj (2017) advocates a multimodal pedagogy for writing instruction in engineering. He notes a general awareness of engineering students' weakness in written and oral communication skills and, consequently, the need for programmatic methods for improving the writing skills of engineers. Meanwhile, current instruction in engineering and technical communication provides little or no emphasis on the integration of written and visual communication. In order to represent well-engineered objects and the multidimensional and repetitive processes underlying the operations of those objects, though, visual communication is paramount (Jeyaraj, 2017).

Brian Ballentine (2008) also recommends integrating design, creativity, and invention into engineering communication courses. The goal, he argues, is for students to "take seriously the concept that art, creativity, and design play an increasingly larger role in engineering" (p. 334). Employers are also recognizing the value of these "soft skills," even in technical professions. Ballentine uses two assignments in his engineering communication course to teach multimodal design skills to students: critiquing a website of their choice and then creating a website that reviews a video game of their choice, combining both Web design and gaming. The goal of this and other assignments is to situate student writing and learning amid contemporary issues (Ballentine, 2008). Ballentine further links the role of study abroad programs in technical communication programs to enhancing students' creative problem-solving abilities (2015).

On a disciplinary level, however, some scholars argue that technical communication is a creative field that must prepare students and practitioners to be creative problem-solvers. Linn Bekins and Sean Williams (2006) write that technical communicators "work in a 'creative economy,' in which workers use their *knowledge* of a product as well as their ability to produce clear, concise, and persuasive *information* about that product to *innovate* a new product, technology, or business process" (p. 287). They argue that technical communication is more about solving organizational problems than producing specific communication pieces, and therefore technical communication curriculum must include the complex instruction that prepares students to be creative workers (p. 287–289). Arguments for enacting creativity in the technical communication classroom include invention techniques such as connecting poetry and art to lessons in design (Welch, 2010) and leveraging other invention skills to solve creative problems (Zhang & Kitalong, 2015). Marc Santos and Megan McIntyre (2016) advocate for a "postpedagogical approach to teaching creativity in technical and professional writing classes by moving outside traditionally recognized heuristics and genres," (para. 39) suggesting that the classroom be a space for flexing creative muscles and learning to handle, as a repeatable method, the "alterity, difference, and the anxiety" (para. 40) of unfamiliar situations or the "unpredictable creative moment" (para. 38). In the next section, we consider such arguments as we encourage integrating creativity and beauty into technical communication instruction and training through new (and not-so-new) genres.

Unlike creativity, with a few exceptions, beauty has rarely been the focus of scholarly writing or research in technical communication. One theme noted in our literature review, however, was the importance of beauty to concerns of usability and utility. For example, Yuejiao Zhang (2016) connects the value of beauty to utility in her examination of two medical texts written in China's Northern Song dynasty. Zhang argues that both aesthetic and usability features in these texts helped them "negotiate their way into printing, circulation,

and becoming canonical in their own genres" (p. 175). (Note that while Zhang uses the terms "aesthetic" and "beauty" interchangeably in her discussion of visual rhetoric, as previously outlined, we do not see these two terms as equivalent.) Compared with other medical texts produced in previous dynasties, these two texts "incorporated more illustrations with enhanced beauty" that made them not only more usable, but ultimately more popular, widely circulated and read, and memorable (p. 200). Importantly, these texts were so much more effective at their communication goals because their illustrations took into account the aesthetic tastes of their intended audiences (p. 200). In other words, though their goal was the dissemination of medical information, the texts were intentionally designed, with great success, to also be beautiful and moving. One study in human-computer interaction has likewise indicated a correlation between a system's perceived beauty and its perceived usability (Tractinsky et al., 2000). Though further research on the connection between beauty and usability/utility is certainly warranted, we suggest that knowledge of and appreciation for the beautiful help technical communicators craft more effective, memorable, and usable texts.

While they do not always address beauty specifically, studies in visual design and data visualization often incorporate discussion of aesthetic considerations in enhancing design. When beauty is addressed in visual design, the tone is often cautionary. Researchers have criticized beautiful design as mere "decoration" or for masking faulty data, obscuring meaning, and/or serving agendas (e.g., Amare & Manning, 2007; Dragga & Voss, 2001; Kimball, 2006), while Daniel Ding (2000) argues that concerns of utility should precede beauty in visual design. Ding writes: "I propose we emphasize 'clarity' instead of simplicity. Simplicity embodies beauty; clarity embodies effectiveness. Our task is to develop effective page layout through clarity" (p. 44). Ding's argument contrasts other studies that link beauty to both the emotional and logical appeal of visual design that serve important persuasive and rhetorical purposes (e.g., Richards & David, 2005; Kostelnick, 2016). And as we will argue later, privileging clarity is not counter to beauty, as beauty, too, can be clarifying.

While not writing specifically about technical communication, Elaine Scarry connects beauty to the social responsibility of the teacher. She writes:

> Teaching well requires that we speak openly about the beauty of poems, plays, novels, and epics not only because it is so often the beauty of the world that has prompted the writing of those works but also because beauty lies at the heart of education; it is among those things that ignite the desire and willingness to learn. (2000, p. 21)

Scarry argues that beautiful things have a generative power, a "forward motion," that rouses a desire to create new beautiful things (1999, p. 46). We argue, likewise, that beautiful writing and design have the power to move audiences in important ways in technical communication. Recognizing and acknowledging beauty changes how technical communicators create. As Scarry points out, beauty can be simultaneously a beautiful object, a cognitive act of "beholding the beautiful thing," and a creative act of "being in the presence of what is beautiful" (1999, p. 95). Encountering beauty encourages practitioners to behold, create, and replicate beauty.

However, Scarry furthers her concept of beauty to suggest not only that teachers in the humanities should teach about beauty, but also that beauty presses us to, or aids our efforts toward, justice. Because her work deals with poems and beautiful objects, Scarry suggests that she "ought to have a higher level of alertness to situations where there is a falling away from beauty, situations where there is an injury" (2000, p. 25). She argues that beauty and imagination must not be excluded from teaching because they are "one important source of the very empowerment against injustice in the external world" as well as a source of inspiration for students "to go into the world and care to uphold or to bring into being arrangements that diminish injury" (2000, p. 25).

Perhaps, then, appreciating and acknowledging beauty can lead technical communicators to be more just in a field that is increasingly concerned with issues of social justice (e.g., Agboka, 2014; Colton & Holmes, 2018; Savage & Mattson, 2011; Jones & Walton, 2018; Walton et al., 2019), as well as help them create and design in ways that inspire and move audiences to action. "A critical approach to diversity and social

justice helps to legitimize [technical and professional communication] by providing scholars with a way to acknowledge the impact of communication as a way of mediating the human experience," writes Natasha Jones (2016, p. 343). How we communicate matters, and every choice we make as technical communicators, from document design and page layout to image and word choice, inevitably shapes our users' experiences. Our choices have the potential to include or exclude, to inform or confuse, to acknowledge or other. We, therefore, recognize and embrace the weighty obligation of technical communicators in challenging and changing systems of oppression and inequality. We suggest that creativity and a sense of the beautiful make technical communicators more effective in these efforts toward justice.

TEACHING AND TRAINING TECHNICAL COMMUNICATORS

We ask students in our courses, and participants in our consulting and training, to confront and embrace these multiple working definitions of technical communication. Ultimately, students begin to disentangle their understanding of "technical communicator" as a position or job for which they might be hired (which, generally, does not align with their goals as they enter our courses) and technical communicator as a role or positionality within their chosen work that will make them stand out as effective communicators and problem solvers within their fields. So, our operating definition of technical communication is about the work, about "providing the right information, in the right way, at the right time to make someone's life easier and more productive." And technical communication is also about thinking and working creatively to find the best solution to a problem.

To illustrate this last point, a good early-semester classroom activity is to provide students with the menu for a week's at-home meals and ask them to turn the menu into a shopping list. Most (but not all) students will simply note the necessary purchases by meal. For example, "Monday: Grilled Cheese and Tomato Soup" and "Tuesday: Spaghetti and Meat Sauce" becomes:

Monday: Grilled Cheese and Tomato Soup
- Bread
- Sliced cheese
- Butter
- Canned tomato soup

Tuesday: Spaghetti and Meat Sauce
- Box of spaghetti
- Ground beef
- Jar of pasta sauce

Some students might decide to make the tomato soup or the pasta sauce from scratch and add whole tomatoes to the list. Students might add breadsticks, garlic, or croutons. The more items on the list, the more instructive part two of the activity becomes. After collecting the lists, the instructor projects a diagram or overhead picture of the local grocery store onto the whiteboard. Then, using a whiteboard marker, the instructor traces the shopping route according to the written list: bread, then sliced cheese, then soup or tomatoes, then spaghetti, then ground beef, then pasta sauce—item by item until the "shopping" has been completed. Inevitably, the shopping path makes several laps of the aisles, back and forth across the store, resulting in a tangled mess of lines. Then the instructor traces a list organized by section: produce, meat, bakery, canned goods, frozen foods, and so on. This path usually makes one lap of the store. Although a lighthearted activity, this serves as a concrete example of how we are all (or can be) effective technical communicators such that our lives are "easier and more productive." Our understanding of technical communication includes any artifact, process, or product whose use, documentation, and implementation can be designed to be as useful as possible. That is, our understanding of technical communication is necessarily and inherently creative. But as the lines converge into a useful, meaningful, logical path, technical communication also becomes beautiful communication. In the following sections, we consider ways that an appreciation for and viewpoint concerning beauty can be cultivated in technical communication classrooms through creative learning techniques. Our proposal is to develop classes and training programs that are highly multimodal, incorporating elements of visual design and storytelling. We examine approaches suggested by technical and professional communication scholars that we feel further the goals of beauty and creativity. We then offer suggestions from our own teaching and corporate training experiences to complement these insights from the literature.

Creativity and Beauty in Technical Communication

Visual Design in the Literature

As noted in our literature review, when beauty has been discussed in the context of technical communication, it has more often been connected to concepts of visual design (and is usually articulated as "aesthetic" features). Tiffany Portewig (2004) argues that technical communicators should indeed be visually literate—both possessing knowledge of visual concepts as well as being able to understand and produce visual messages. In addition, visual literacy involves an awareness of the rhetorical situation connected to visuals, how to communicate with visuals, and how to represent visuals (Portewig, 2004, p. 32). Students and practitioners today take on many roles as visual communicators on social media, online, mobile, and other platforms. Especially in the digital age, the ability to work with and integrate the visual in technical communication is one of the most important literacies a student can acquire in their course of study. Technical communicators must be prepared to make clever choices when combining text and visuals to support users effectively. We suggest that, while creative approaches can help students think more intentionally about audience, purpose, and visual elements in technical communication, a knowledge of the beautiful also supports these choices.

Students, and later practitioners, must understand the relationship between visual and audience and the ways that technical communication employs beauty and visual elements to develop effective, memorable messages in various public mediums. Asking students to craft an organizational structure and develop effective supporting visual aids helps them understand visual design's role in creating their own specific style for presenting and sharing various kinds of information with others (Kedrowicz & Taylor, 2016). The way that audiences encounter and interact with information has been changing rapidly, increasing the need to think and create both visually and spatially, as well as connect on a human level (Amare & Manning, 2007; Welch, 2010; Kostelnick & Roberts, 1998; Kostelnick, 2016; Portewig, 2008; Brumberger, 2005). Beyond simply crossing other areas of learning, visual literacy's importance has intensified in significance and use. For example, data displays—including charts, graphs, maps, infographics, and more—have exploded in popularity in the digital age. Many students are already familiar with common technical visualization genres such as bar charts, pie charts, and graphs, but we question whether communication instruction pushes these conventions or prepares students to analyze them critically.

Infographics

Infographics, in particular, have proliferated on social media. Especially with the now widespread use of data displays online, information consumers are "immersed in data visualization" (Kostelnick, 2008, p. 116). Beauty is a goal in developing infographics, but it is not the only goal. As Sam Dragga and Dan Voss (2000) warn, technical illustrations should not lose their humanity in the pursuit of goals like conciseness, clarity, and aesthetics. "Ethical visuals must be as humanistic as ethical words" in humanizing technical subjects, argue Dragga and Voss (2000, p. 266). Students and practitioners must not only be able to interrogate the ethics of visual communication and identify graphic deception but also consider how their design choices ultimately impact people.

Sketchnoting

Sketchnoting is a style of note taking that blends images/doodles and text to communicate content. Sketchnotes are good for taking notes on lectures and in meetings, but they are also especially helpful when reducing complex projects into elements and relationships. Sketchnotes can be overlaid on workflow or Gantt charts to better contextualize data. But perhaps just as key to their utility, sketchnotes also offer a beautiful, and therefore more memorable, archive of ideas. "By live drawing on paper, the visualization of talk and ideas are created spontaneously but can also be shared and saved," notes Abigail Selzer King (2017, p. 193). As she features her own beautiful work of drawing and illustrating various lectures, Selzer King argues that "live drawing in the classroom meaningfully disrupts expectations of linear, rehearsed trajectories through content" (2017, p. 192). By leveraging the power of beauty and art, sketchnoting is not only less boring than traditional note taking but can make the content clearer and more meaningful to users, as well as better represent the connection between ideas. This is one example of how beauty can indeed be clarifying.

Drawing

Drawing is thus an ideal method for teaching visual literacy in the classroom, and specifically for focusing on visual and creative thinking. For example, Neal Lerner (2007) has noted a return to the use of drawing and visual forms in science instruction. Recalling the pedagogical ideas of mid-nineteenth century Harvard professor Louis Agassiz, Lerner points to the possibilities of learning science and experiencing it firsthand as an active process through drawing. By observing and drawing to learn, students are no longer passive repositories of information, but active participants in the creation of important knowledge—created, we would add, in beautiful ways (Lerner, 2007).

Of course, drawing as a teaching method that supports visual thinking has applications beyond scientific fields. Drawing as an invention or brainstorming technique is standard practice in creative writing, where students might sketch out a scene or plan a narrative arc. Creative writing textbook author Heather Sellers (2017) suggests sketching as a way for writers to get unstuck, re-see their work, picture a scene as if in a movie, and connect with the five senses. And as King et al. (2017) note, drawing does not need to be elaborate to be useful, arguing that "simple geometric drawing tasks are a useful vocabulary for developing communication ideas" (p. 71). In their case study of a workshop to develop communication solutions to explain complex information about sun block effectiveness, King et al. found that drawing served as an effective problem-solving strategy among participants (2017).

Storyboarding

In technical and business communication, storyboarding is a similar technique used to order information visually through illustrations and text, whether planning a film, presentation, ad concept, or other message. In his study of using storyboarding as an invention technique in a basic writing course, Jon Balzotti (2016) found that storyboarding helped students connect ideas and make better arguments. Balzotti writes that "students who used storyboarding as an invention exercise learned to employ *literacies* in more and flexible ways: solving problems, exploring ideas, making arguments based on rhetorical situation or need and supporting ideas with evidence" (p. 80). Expanding student writing practices to include visual means of invention like storyboarding can improve their ability to blend and compose multimodal texts (Balzotti, 2016) that solve communication problems, which works hand-in-hand with encouraging creativity and beautiful thinking as essential in technical communication.

Film

Film is also an ideal genre for demonstrating how unified images can be analyzed to understand audience and purpose (Richards, 2009). Marty Shelton suggests that the "kinetic sight-and-sound communication medium" of video and film is a distinctly different way of "encoding messages and transmitting them to our audiences" (1993, p. 656). He argues that while technical writers are typically not trained in this type of visual media, film is ideal for teaching students how to blend information in the "right mix" of kinetic images, narration, dialogue, and other sound elements to reach and move an audience (1993, p. 659).

Visual Design in Our Experience

Most courses in creative and publication design will include discussion of principles like hierarchy, balance, contrast, alignment, rhythm, and scale. But the means and effectiveness of teaching design principles alone is by no means canon. Miles Kimball describes design principles as a "kind of lore" or contingent knowledge based in practice that have not been fully researched or understood in the field (2013, p. 5). Meanwhile, though teaching visual design principles and practices to students of technical communication may support a knowledge of the beautiful, the extent to which these concepts are currently included in technical communication instruction is questionable. A communications manager who has worked in the architecture/engineering/construction (AEC) field for 20 years expressed to us that, in her experience, she has rarely been able to find an entry-level technical communicator who has the creative skills to "craft compelling and interesting stories succinctly and in a visually exciting way" in the AEC workplace, including experience in genres such as storyboarding, script writing, video, and page design: "If you find one, please send them to me so I can hire them," she said. These creative skills, she argued, help technical

communicators "translate complex concepts and solutions to audiences with varying degrees of understanding and who comprehend information in different ways." To help students grasp and retain visual design principles in fun, creative, meaningful ways that attend to some of these concerns and promote an understanding of/appreciation for beauty, we suggest employing genres like essentializing, drawing, and visual storytelling.

Essentializing and sketchnoting

Two ways to encourage students to think visually and develop graphically driven, beautiful artifacts are "essentializing" and "sketchnoting." As previously discussed, sketchnotes are useful for reducing complex projects or ideas into elements and relationships, but they are also a creative and fun way to make lectures and lessons more meaningful and memorable for the listener. See, for example, Andrew's sketchnote during a lecture on Gorgias and the Sophists in Figure 4. Essentializing (some students might refer to this as #hashtagging) asks students to use a word or phrase—or even an image—to articulate the essence of their projects. Students working together as a team on a project might perform this activity anonymously to discover what they each understand their project to be about. Essentializing is a good tool to introduce brief elements of creativity and other perspectives into a project workflow. In fact, this activity works well for all of the senses. We ask students, "What does your idea look like? What does it sound like? What does it feel like?" I (Andrew) have used essentializing in both teaching and training to help students, teachers, and practitioners get to the heart of a concept or project, and I have seen benefits of essentializing for participants in both the invention and review stages of their project or task. During invention, a project group can essentialize together to determine the most meaningful element, aspect, or philosophy of their project. After project completion, individual group members or a test user group can conduct an essentializing activity to determine if the essence of the final project matches the group's intended purpose at the beginning. Essentializing is, therefore, a creative and useful way for students or trainees to plan and visualize their project as well as measure their success in achieving communication goals.

Infographics and data visualization

As discussed, technical communication instructors and trainers should not only introduce infographics and other types of data displays in their classrooms, but also emphasize how humans perceive and interact with this genre. We have argued that the definition of beauty and its purpose in technical communication is not merely decoration or aesthetic considerations, and this particular genre highlights this distinction well. For example, as is common in technical and professional communication courses, I (Kathleen) often give students an assignment to evaluate a series of infographics and other data displays for features like clarity of message, suitability of the visual chosen

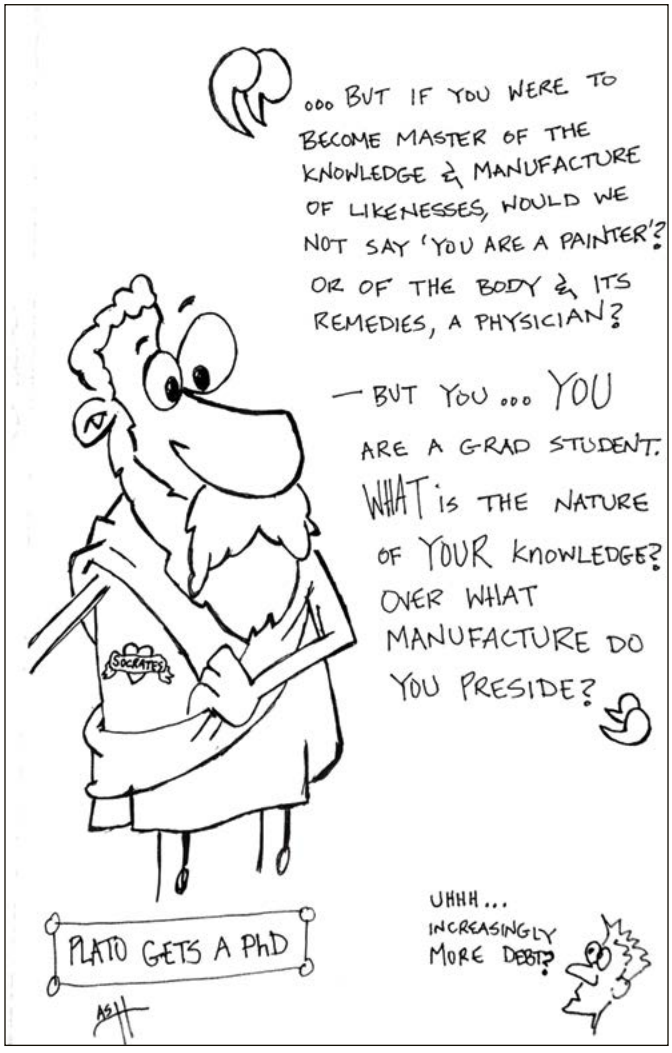

Figure 4. Andrew's sketchnote during a lecture on Gorgias and the Sophists

for the data story, effectiveness of design, and data accuracy. I have found that my students will readily critique matters of taste or appearance in design, such as a chart that is too busy or cluttered, colors that are too subtle or that clash, labels that are difficult to read, or a visual that is overall unattractive to their eye. Students will articulate if a graphic "makes sense" to them or is aesthetically pleasing. However, in my experience, the depth to which students are prepared and/or confident to make decisions or critiques about data distortion or the choice of visual used to tell the data story beyond aesthetic or informative considerations is much shallower.

Scholars and practitioners of technical communication are well aware that visual data can be manipulated to skew data, mislead readers, or tell a data story that is incomplete or inaccurate, perhaps obscured further by a beautiful display. Some scholars (e.g., Ding, 2000) would therefore privilege clarity in visual design over beauty. As we have argued, though, the goals of clarity and beauty should complement, rather than counter, each other. Beautiful data visualization should not only be striking and pleasing to the eye, but also more memorable, meaningful, and usable. Recall Zhang's (2016) argument that beautiful design helped make Chinese medical texts more useful and effective to their audiences. To this end, we argue that an understanding of and appreciation for the beautiful gives both students and technical communicators greater skill in evaluating unethical representation—situations where, to quote Scarry, "there is a falling away from beauty" (2000, p. 25).

Drawing and storyboarding

In our experience, we have found that drawing (even using stick figures or rough sketches) helps students—especially visual learners—plan, connect, organize, and untangle their ideas. Because it is low-tech and requires only a pen/paper or marker/whiteboard, drawing is also an easy way to integrate a hands-on, creative, and potentially collaborative learning technique into classroom instruction or training sessions. When we ask students to sketch out their ideas, we usually keep the prompt simple, since students often have an initial hesitation about their drawing abilities. Being able to visualize a scene on the page through drawing, even rough sketches, supports engaging creative practices like writing in images rather than explanation.

During our interview with the aforementioned AEC communications manager, she expressed a desire for teachers to invest time in helping technical communication students learn how to storyboard, specifically, because this technique is a visual way to "clarify the intended message and make sure what we write supports the intended themes." We use storyboarding in multiple ways during instruction, as both a pedagogical tool and as a practical application. For example, at the beginning of a new unit, I (Andrew) ask students to storyboard what they imagine they will learn on this topic, what learning activities they will complete, how they will complete them, and in what ways they will interact with others. I ask them to storyboard these scenes (rough sketches accepted). Pedagogically, this activity helps students reflect ahead and prime themselves for the work they are about to do and the concepts they may encounter. Practically, when students propose developing video artifacts as part of the course, I ask them to storyboard the entire video before recording so that both I and their peers can provide feedback and suggestions on the content. This activity saves the students time and, as the communications manager has noted above, ensures that the final product matches the intended themes or messages. Through storyboarding, the student or team can plan their project (locations, materials, staging, etc.) before one second of footage is recorded. In fact, storyboarding can be used for virtually any planning activity, and it does not need to be "formal" or time-consuming. See, for example, Andrew's impromptu or "flash" storyboard (Figure 5) where he considers his audience for a teaching activity. Students and practitioners can learn storyboarding techniques in the context of thinking about their intended audience and message, but also by placing themselves in the "scene" of the project. Consider, for instance, what a student managing a project, such as a design task or a research paper, would "look like" in practice. The same technique could be used for a practitioner planning a proposal, presentation, or any number of workplace scenarios. Storyboarding is thus a creative technique for visualizing information and for planning, organizing, solving, and/or untangling communication challenges.

Beautifying text

Another way to encourage students or employees to share about themselves while teaching visual concepts

Creativity and Beauty in Technical Communication

is to choose their favorite quote and make it beautiful. This assignment, which is appropriate for nearly any visual communication topic, can serve as an excellent (and low stress) introduction to multiple visual concepts like typography, color theory, alignment, image placement, and proximity. If the instructor is teaching a particular software program, such as Adobe InDesign, this is also an ideal beginning design project.

Because participants are choosing a quote that is personally meaningful to them (whether from

Figure 5. Andrew's "flash" storyboard to consider audience

literature, a famous personality, or even a friend or relative), they tend to be more enthusiastic about sharing their work with their classmates/colleagues. And we do recommend that participants be asked to share their work, whether in class instruction or corporate training, because we have found that sharing and contributing when working through creative exercises is an important aspect of both team building and reducing creative anxiety. The willingness to share, collaborate, and workshop with others is likewise a crucial skill that directly translates to the technical communication workplace. We suggest using this type of assignment as a starting point for further discussion about making visual decisions in document or graphic design. This assignment can also further the goals of encouraging an appreciation for the value of beauty and its ability to move others, as well as for making design more meaningful through beauty. As an added bonus, the final designs are great for decorating bulletin boards or workspaces.

Film

Since safety information and instructions are typical components of most technical communication courses, we suggest that one excellent assignment is to ask students to create a safety video for any purpose. For example, search online for Princess Cruise Lines' recent safety video featuring the original cast of *The Love Boat*. It blends safety information, popular culture, and humor as a refreshing alternative to reach cruise passengers who might otherwise loathe pausing their vacations for boring safety briefings. This solution also considers context, as many cruise passengers are among the age group that remembers and values *The Love Boat*. Students likewise should be challenged to consider audience and purpose to communicate safety or other technical information in a fun, accessible, and meaningful/moving way. In our experience, teaching with and about film helps bridge the gap between verbal and visual thinking. When practicing scriptwriting, script design, or storyboarding for film, for example, our students learn to think in images and scene—not only how words appear on a page, but also how those words will be spoken and performed visually and physically on stage or film. As Shelton writes, "Film/video scripting is designing for the eye," which we argue is, by its nature, a creative, moving, and beautiful endeavor (1993, p. 655).

Other media

As the definitions, purposes, and products of technical communication have evolved, so too must the teaching and training of technical communicators. We encourage students and instructors to explore emerging genres and "unconventional" genres in teaching visual design. Students and employees learning about visual design might develop infographics, YouTube videos, graphic novels, 3D models and prototypes, smartphone apps, or board games—all under the umbrella of technical communication. Students might even develop the processes, documentation, and iconography for social movements similar to #MeToo or local marches for awareness such as hunger and food deserts. When studying visual design principles, learning to make and perform technical communication beautifully involves incorporating innovative genres and purposes to emphasize creativity.

Storytelling in the Literature

Nancy Small has advocated for the value of storytelling and narrative in technical communication instruction, arguing for "a fresh direct reengagement with stories, storytelling, and narrative as valuable ways of studying and effectively producing the varied texts of the workplace" (2017, p. 234). Adding moments of personal reflection and sharing—beautiful moments—into technical communication instruction reinforce the interpersonal skills and emotional intelligence (i.e., human factor) that are critical to effective practitioners.

Exploring new and trending genres for visual storytelling, such as the graphic novel, also has exciting potential for engaging the "current generation" in the creative potential of technical communication. Jeremy Short and Terrie Reeves (2009) and Short et al. (2013) argue that the graphic novel format translates well to business communication and education while engaging an increasingly visual and tech-savvy generation. In addition to teaching visual presentation and layout, the graphic novel is an ideal medium to teach storytelling as an effective strategy for communicating business concepts (Short & Reeves, 2009, p. 415). The graphic

novel has potentially exciting applications in both business and technical writing classrooms.

Storytelling in our experience

Anecdotally, whenever we ask students to reflect on their work and experience at the end of a semester, we usually receive some version of the same general sentiment: "Coming into this class, I never saw myself as a creative person. I found that I am much more creative than I thought." Most express a general anxiety (or even dread) about the course at the beginning of the semester, but find an increased confidence and enjoyment of writing and/or designing at the end. One student in a writing course recently reflected:

> At the beginning of the semester, I thought this was going to be torturous because I was not as confident in my ability to write. . . . The way I pursued writing changed . . . I don't look at it as something I hate doing anymore. I think the thing that changed the most about me is the confidence in my ability to write.

We do not attribute such new-found creative awareness and writing confidence to our abilities as teachers or to our students' skills learned in a particular subject area or software program. More importantly, we read these sentiments as gaining greater awareness of what it actually means to be creative and finding value in their own contributions. And, as their reflections often indicate to us, that courage to try new, creative techniques comes from the beautiful moments found in the opportunities we offer them to explore and share their own stories. As one student recently explained in his course reflection, writing about his own experiences, even painful ones, helped him learn to "show and not tell" in his writing, as well as gain confidence in putting his words on paper.

Every spring, I (Kathleen) teach creative writing to a class full of non-liberal arts majors. Sometime in the first couple weeks, I inevitably end up playing one or two scenes from the movie *Dead Poets Society*. In one scene, English teacher John Keating (played by Robin Williams) encourages his students to live their lives to the fullest. "Carpe diem," he declares. "Seize the day, boys. Make your lives extraordinary." In another scene, Keating takes on the question of why his classroom full of future doctors, lawyers, engineers, and business leaders should care at all about studying poetry. "We read and write poetry because we are members of the human race," says Keating. "Poetry, beauty, romance, love, these are what we stay alive for."

This semester, anticipating that I would share these scenes again, I asked students to bring in a piece of creative writing, broadly defined, to share with the class as well. I gave no instructions beyond thinking of something—whether from literature, movie, television, song, or otherwise—that had really resonated, moved them, and "stuck with them." It was a gentle prompt to find beautiful artifacts. So, this time, I played the clip of privileged boarding school boys encouraged to live life to the fullest alongside J. Cole's performance of "Be Free" on David Letterman and the artist's moving pleas simply to be able to live. My standard lesson plan had been amplified considerably by my students' contributions. As an instructor, it was a beautiful moment. As we mapped our themes at the end of the discussion, I found that all of the students had gravitated to big, important life themes—life, love, learning from mistakes, making every moment count. Perhaps this is why storytelling resonates with all of us.

Great storytellers make great technical communicators, as storytelling is part of our everyday work lives no matter the medium. (In fact, we have just told a story in our process of writing this section about storytelling.) Perhaps the confluence of creativity, beauty, and visual storytelling is the graphic novel, and, as we have argued, this genre has exciting applications in technical communication instruction/training. For example, it is typical for illustrations to accompany various types of instructions, but students might use a comic or graphic novel format to portray a user actually using a set of instructions or working through a training process. Another option is to ask practitioners to describe their typical job functions or "a day in the life of a technical writer" in graphic novel format to increase understanding of their role within their teams. A proposal team could use a graphic novel style as a planning tool, sketching out their development process, presentations, and more. Many opportunities are available for applying graphic novel in both the classroom and workplace. In fact, the Federal Reserve Bank of New York has published a series of comic books to teach students about basic economic principles

such as monetary policy, banking, and the story of the Federal Reserve System. Activities incorporating the graphic novel genre help students and practitioners hone their skills in visual presentation and storytelling, both critical skills for technical communicators. It also offers an opportunity to "re-see" the standard work products associated with technical communication as both beautiful and creative.

(RE)CONSIDERING TECHNICAL COMMUNICATION

Making technical communication more humanistic is not a novel idea. More than four decades ago, Carolyn Miller (1979) argued that technical writing has humanistic value and suggested rethinking the goals of technical writing as a humanistic study. Yet, long-held beliefs that separate technical and scientific fields from beauty, art, and creativity (to quote Mr. Keating, from that which makes us members of the human race) very much persist. Our previous discussion is about possibilities. We consider what would happen if technical communication embraced "creativity" and "beauty" as key terms. If teaching and training incorporated new ideas and techniques centered on these values, we imagine how it might lead students and practitioners to reframe both themselves and the work they do as technical communicators to embrace the beauty in the processes and products of technical communication. We recognize that "what if" does not satisfy our field's (appropriate) desire for data and empirical evidence. In 2015, Zhang and Kitalong expressed their hope that their study of creativity in technical communication would serve "as a starting point for broadening the scholarship in understanding the forces that shape technical communicators' creativity in the workplace," noting a lack of research that focuses on technical communicators' creativity in practice (p. 212). Our own literature review suggests that, five years later, this call remains important but, as yet, largely unanswered. We encourage further studies of creativity and beauty in both technical communication workplaces and places of teaching/training.

Beauty and creativity are important approaches to technical communication problem solving; they are another way in which we can "[reconceive] power to illuminate how and where we can intervene in injustice" (Walton et al., 2019, p. 103), the status quo, systemic and hegemonic practices—because beauty and creativity allow us to help our users and students see the world around them in clarifying ways. This clarity has significant professional and pedagogical consequences. A profession or pedagogy that cannot move beyond 12 pt. Times New Roman operates from a particular, established, and often unjust position of privilege. A rhetorical theory of technical communication that "want[s] more than what is given" that "want[s] a future" (Gerdes, 2019, p. 235) that recognizes its own privilege and position should also embrace beauty and creativity.

Clarity, arguably privileged above all else in technical communication, is not always a matter of straightforward and concise language. Beauty, too, is clarifying. Recall the Food Network chefs articulating their points of view: Beauty is a mechanism by which we come to understand and communicate our relationship to the content. A sense of beauty informs how technical communicators design, connect ideas, and position ourselves; it reflects our values and ethics. It is our responsibility, then, to teach our students how to compose, build, develop, design, and write beautifully.

We suggest that teachers and trainers can accomplish this in their own classes in a variety of ways, including encouraging students to experiment with genre and to challenge the boundaries of convention. Interesting and innovative—creative and beautiful—things happen when students (technical communicators) work in the interstices between tradition and the avant-garde. Classes can be designed to guide students toward a more creative and beautiful interpretation of technical communication, and these considerations should be woven into all aspects of a technical communication course or training, not just moments of formal instruction. Even course materials (syllabi, handouts, rubrics, PowerPoints, course websites, etc.) are teachable moments and should be carefully and beautifully designed, as well as be clear, logical, and comprehensive. The goal is to perform beauty and creativity, and communicate expectations, through every aspect of the course or training. Materials, lectures, and ideas are informed by developing meaningful work, made more useful and valuable through creativity and beauty.

Our epigraph to this article is the quote from George Washington Carver: "When you can do the

common things of life in an uncommon way, you will command the attention of the world." Technical communication sometimes gets short shrift from stakeholders and students as dull or uninspired. That it is necessary, but common. We believe, however, that technical communication is the practical application of creativity and beauty in order to make "life easier and more productive." It is remixing to re-see. We should guide our students to do the common in uncommon ways—ways that are striking, startling, delightful, and inspired. Technical communication done uncommonly leads to an innovative and beautiful solution.

Consider, for example, the map of the London Underground.

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Creativity and Beauty in Technical Communication

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Drawing on Personas: How User Personas Affect Creativity

By Candice Lanius, Ryan Weber, Jackie Spiegle, Joy Robinson, and Robin Potts

ABSTRACT

Purpose: While many industry professionals, including user-experience designers, create personas to represent their target users, debate still exists about whether personas really help organizations improve user-centered attitudes and product design. This study tested whether personas increase performance and empathy on a creativity task.

Method: 172 participants completed a creativity task in which they were given seven minutes to draw a space alien. Participants drew aliens either for themselves, an unspecified author, or an author represented by a persona. Participants also completed a survey collecting their attitudes about the activity and alien drawings. Four coders then used a five-item rubric to evaluate the creativity of each drawing.

Results: There were no differences in creativity scores for the alien drawings between the persona, self, and other author groups. However, people drawing for themselves and the persona author were more confident in their alien drawings and more willing to share them. Within the persona group, those participants who reported thinking about the persona while drawing had more positive feelings about the drawing and the author who would use it.

Conclusion: While the persona did not result in more creative drawings, personas may increase confidence and user-centered attitudes among designers when actively used.

Keywords: personas, creativity, user experience, design processes, empathy

Practitioner's Takeaway:

- Personas did not make people more creative in their designs. However, personas can increase designers' likelihood of thinking about the user and confidence that their work meets user needs.
- User-centered attitudes only increase when designers actually report using the personas they receive, meaning that technical communicators and UX professionals should devote effort toward not just persona creation but also persona adoption among teams.
- By enhancing user-centered attitudes, personas can make a valuable contribution to a company, one that helps technical writers develop their own organizational legitimacy.

Drawing on Personas

INTRODUCTION

The experiment described in this article was inspired by the frustrations of our three authors who work as UX designers: Jackie, Joy, and Robin. As part of following the best practices of user-centered design (UCD), these three regularly produce personas that describe characteristics of key users, such as their goals, needs, frustrations, and behavior (see Figure 1 for an example persona). In theory, personas enhance product design, team communication, designer empathy, and team creativity (Miaskiewicz et al., 2009; Antle, 2008; Ferreira et al., 2015; Getto & St.Amant, 2015; Putnam et. al., 2016; Rose & Tenenberg, 2017). In practice, personas require significant overhead to develop and maintain correctly. This overhead includes meeting with users to gather data, compiling data to find trends in key areas, creating persona artifacts for sharing (posters, baseball cards, digital repositories, etc.), and updating these artifacts whenever more users are identified or user groups change.

Our authors have devoted a significant amount of time to developing personas and thus identified with the arguments of Friess (2012), who observed that, "Given the 1-4 month estimates for persona development, refinement, and deployment, personas appear to be a resource-expensive tool for design development" (p. 1216). According to a Nielsen Norman Group survey of 216 practitioners, empirical personas can take between 72.5 to 102.5 staff hours to create, placing their cost in the thousands of dollars (Flaherty, 2015). On top of the effort devoted to creating personas, these authors struggled to get developers and designers to adopt personas and reference them while making design decisions. Rationalizing the cost of personas can be difficult, especially with tight budgets, short timelines, and the neglected position of UX teams in some companies.

Our authors' own conflicted feelings about the value of personas play out in technical communication and user experience literature as well. Personas should help teams design for actual users instead of relying on assumptions about them, or even worse, drawing inspiration from the design teams' own preferences (Pruitt & Grudin, 2003; Mulder & Yaar, 2007). The goal, as Cooper (1999) describes it, is for the persona to become "a real person in the minds of the designers and programmers" (p. 128). In describing their use of personas at the company *Cisco Systems*, Nieters, Ivaturi, and Ahmed (2007) write, "a persona—as an archetypical figure—can guide decisions about product features, navigation, interactions, and even visual design" (p. 1818). Ideally, personas should allow designers to think like their users, enhancing both creativity and designer empathy in the process (Miaskiewicz & Kozar, 2011; Pruitt & Adlin, 2010; Hudson, 2013). Creativity involves original expression that is appropriate for the setting (Ivcevic & Mayer, 2009). In the realm of technical communication and user experience, personas represent both a product and process where artistic creativity is encouraged as a mechanism to achieve audience-focused documents and user-centered designs. Personas are the creative expression of rich, detailed research into the target audience and primary users, but knowing that something works in theory does not guarantee it will work in practice.

Despite the widespread use of personas and many books and articles asserting that personas work (Nielsen, 2013; Mulder & Yaar, 2007; Brown, 2010), questions have arisen about whether personas really live up to their potential in practice. Once created, are personas used? Some teams rarely use the personas they have developed (Friess, 2012). As Blomquist and Arvola (2002) concluded after a twelve-week ethnography of a design team, "The personas, Richard and Eric, had a limited role in the design work. [The personas] were in the background, hanging on the walls of the office landscape and in the conference room. Richard and Eric of course had the leading role in the scenarios but nobody talked about them" (p. 199). Are personas a genuine part of the writing/design process? Other teams use personas to justify decisions they made through other means (Rönkkö, 2005; Matthews et al., 2012). Even if teams use personas, they may not cultivate user-centered attitudes. Chapman and Milham (2006) argue that personas cannot be validated to ensure that they represent real users. Massanari (2010) argues that, despite the intent behind personas, they can "serve to reinscribe the conceptual separation between the user and the designer" (p. 401). Do personas honestly reflect the audience and users? Personas may rely on poor research (Brumberger & Lauer, 2020) or stereotypes (Turner & Turner, 2011; Marsden & Haag, 2016; Cabrero et al., 2016), limiting their ability to provide real insight on real users. Meloncon (2017) advocates

for expanding the information provided in personas after working on projects where the "personas that we created using existing guidelines from the literature were not adequate to accurately convey the complexity of our users and their goals" (p. 51). Grace (2018), former director of product at Slack, puts her critique bluntly by writing that " . . . personas are garbage. I can't think of a more common offender than personas in creating a shield between companies and their customers" (Online). Addressing these questions and critiques of persona effectiveness have created a sense of urgency for scholars, practicing technical communicators, and UX professionals. Howard (2015) argues that empirical studies that challenge the usefulness of personas remind us "that we can't become complacent in our use of UCD tools" (p. 25). Our field must carefully validate our tools instead of assuming they work.

Our corporate authors wanted to experimentally test the value of personas for themselves. This process could provide evidence to justify persona creation and prove to management that personas can help a small UX team increase empathy, user-centered attitudes, and creative solutions throughout the company. In researching ways to test creativity, these authors encountered the work of Polman and Emich (2011), who adapted an experiment from Ward (1994) that asks participants to draw an alien in seven minutes. By evaluating the creativity of these alien drawings, Polman and Emich concluded that participants produced more creative aliens when they were asked to draw them for a story someone else would write compared to when they were asked to draw an alien for themselves. Those findings seemed to provide abstract empirical evidence for the value of personas in that designing with someone else in mind improves creativity. With the addition of a group that specifically drew for a persona, the alien task could provide one measure for how personas affect creativity and user-centered attitudes. This alien drawing task offered several advantages for practitioners wanting to quickly and reliably test the effects of personas. First, the task offers a concise and concrete exercise that nevertheless "has the capacity to assess individuals' ability to go beyond existing category information and generate something novel" (Polman & Emich, 2011, p. 493). Second, the creative task can be scaled and quickly explained to a broad group of participants who can be segmented into groups with different design imperatives. Additionally, drawing an alien for different audiences involves making creative decisions under specific constraints, much like more traditional corporate design tasks. Lastly, aliens can be reliably coded for creativity, with Kozbelt and Durmysheva (2007) finding strong inter-coder reliability when using multiple coding methods. Therefore, our corporate authors approached faculty at the University of Alabama in Huntsville to help design an experiment that would use the alien drawing task to give them insight on the value of personas.

This article describes the resulting experiment, which extends the Ward (1994) and Polman and Emich (2011) methodology to specifically test personas. In our experiment, participants were asked to draw a space alien for either themselves, an unspecified author, or an author described in a persona. This task tested the following hypotheses:

> Hypothesis 1: Aliens drawn by participants for an author described in a persona will be more creative, on average, than those drawn by participants for themselves or for a generic author.
>
> Hypothesis 2: The use of a persona while completing the alien drawing task will increase user-centered attitudes in participants.

The experimental results did not support the first hypothesis: Results indicate there was no difference between the persona, self, and unknown author group on the creativity rating assigned to the alien drawings by a team of raters. There was some evidence to support the second hypothesis: In responding to the questionnaire, participants showed better user centered attitudes if they relied upon the persona to complete and inform the creation of their alien drawing, suggesting that personas can foster user-centered attitudes.

As part of a special issue that establishes the dimensions of creativity in technical communication, these results offer a unique perspective on the issue of creativity in technical communication. First, the experiment uses a drawing-based research methodology as part of empirical research, suggesting that researchers can incorporate artistic methods into qualitative and quantitative research, following the lead of many UX practitioners (Fluery, 2012; Xu et al., 2009), as well

as many technical communication scholars who have considered the pedagogical and research implications of drawing (Rice-Bailey et al., 2019; Salinas, 2002; Ross, 2017; Malone, 2019; Yu, 2015; Petersen & Matheson, 2020). Second, this article considers personas as documents that should facilitate creativity (So & Joo, 2017). Zhang and Kitalong (2015) found that technical communicators consider "thinking like a user" (p. 199) an essential part of their creativity, and personas can facilitate that creative process. Personas operate at the intersection of creativity, user research, and rhetorical work, one space where Lauer and Brumberger (2016) see technical communication and user experience converging (p. 262). Technical communicators should further consider how personas can inspire creativity and how we can produce more creative, aesthetically pleasing, and useful personas that combine research and artistry to improve creativity and design.

LITERATURE REVIEW

The Influence of Personas on Design

Technical communication, user experience, and other fields offer a rich body of research on how personas affect design. Many scholars argue that personas can improve design by fostering empathy, perspective taking, and user-centered design approaches that focus product creators on specific user needs (Grudin & Pruitt, 2002; Aquino & Filgueiras, 2005; Grudin, 2006; Brangier & Bornet, 2011). The hope among advocates is that personas can help designers tap into the potential described by Cooper (1999): "Looking at things through the lens of the user's goals can give us a unique and powerful perspective that opens up new opportunities for creative design" (p. 177). In a survey of experts, Miaskiewicz and Kozar (2011) found that audience focus, prevention of self-referential design, empathy creation, and innovative thinking all ranked among the top ten benefits of persona use. According to practical guides (Caddick & Cable, 2011; Unger & Chandler, 2012) and case studies (St. Peter, 2015; Getto & St.Amant, 2015; Cabrero et al., 2016), personas help designers think from their users' points of view. For instance, for technical communication faculty working with designers on improving an online coastal atlas, "personas can help digital rhetoricians to represent the user base of an application as a 'manageable and memorable cast of characters,' rather than just as a list of user requirements, numbers, and statistics" (Getto & Moore, 2017, p. 18). As Mulder and Yaar (2007) argue concerning the benefits of persona in Web design, "People who work on web sites know their business and know how things work, so their first instinct is usually to make decisions based on themselves. [. . .] Personas help you live in your user's shoes" (p. 23).

The perspective-taking prompted by personas may also contribute to product creators developing empathy for their users. According to Pruitt and Aldin (2010), "A major virtue of personas is the establishment of empathy and understanding of the individuals who use the product" (p. 155). Hudson (2015) echoes this goal, arguing that personas help create empathy to overcome the fact that many "developers assume the users are similar to themselves" (p. 52) and "find it hard to see a problem from a perspective other than their own" (p. 51). Miaskiewicz, Grant, and Kozar (2009) tested their assertion that personas "can introduce greater empathy into the design process" (p. 2) and found that "participants who had more empathy for the persona produced significantly better designs" (p. 5). So and Joo (2017) made a similar assertion that "empathy, in turn, ultimately should generate more creative and more human-centred solutions" (p. 460); their experimental results show that persona use does increase originality of ideas. The theory behind personas, long promoted by both user experience and technical communication scholars and practitioners, is that personas improve design by getting designers to empathize with the user's viewpoint.

However, many interview studies and ethnographies find that while teams create personas with good intentions, personas rarely drive design decisions (Blomquist & Arvola, 2002; Vincent & Blandford, 2014; Friess, 2012). In one team, design discussions only referenced personas 3% of the time as team members often referenced less well-defined tools and standards for decision making (Friess, 2012). Other teams have found that "it was, however, difficult for us to make the 'personas' live their own life and talk back in the design situation. The 'personas' did not get us any closer to imagining the actual use situations" (Bødker et al., 2014, p. 99). Designers have expressed concerns (Matthews et al., 2012; Guðjónsdóttir & Lindquist, 2008) that personas are too impersonal, abstract, or irrelevant to help in design processes; these designers most often use personas to communicate and justify

existing design decisions to a group rather than make decisions. While some design teams express satisfaction with personas (Nielsen & Hansen, 2014), most seem to eschew using them, especially as a decision-making tool. Practical guides to persona creation often warn of this same problem. As Brown (2010) cautions, "Like any artifact not directly related to documenting the design, it can be challenging to ensure that personas are truly useful to the design process. They have the annoying habit of ending up on a shelf" (p. 37).

Fewer researchers have conducted formal experiments to understand the effects of personas on empathy and product design (Chang et al., 2008), but these experiments often produce positive correlations between persona use, empathy, design, and creativity. Personas can increase creativity by inspiring empathy, according to an experiment by So and Joo (2017) that asked 50 students to brainstorm solutions, either with or without personas, to make a workplace less stressful. The results indicated that "design thinking practitioners can expect more original ideas and overcome design fixation if they brainstorm on a persona which is modelled in a concise and consistent way that caters to understanding the user need" (So & Joo, 2017, p. 459). Similarly, personas engendered empathy and improved iterative design thinking in experiments that task participants with solving design problems (Miaskiewicz et al., 2009; Dahiya & Kumar, 2018). Personas with avatars "led to more user-centered, needs-oriented ideas" (Buisine et al., 2016, p. 583). Another study found that student teams using personas developed designs with better usability (Long, 2009). A semester-long experiment in a design course found that profiles and personas improved students' understanding of end-user needs and resulted in final deliverables ranked more highly for their user-centered design (though user profiles showed advantages over personas) (Ma & LeRouge, 2007).

Other studies find more nuanced benefits of personas. Information communication technology professionals have generally positive feelings about personas but share both advantages and drawbacks (Putnam et al., 2016); advantages included greater focus on users, empathy towards users, improved team communication, and helpful user research, while drawbacks included concerns that personas were too abstract, too unbelievable, or not used. Using personas for a heuristic evaluation of website usability does not help people identify more usability issues, but it does encourage more user-centered language in their reporting of issues (Friess, 2015). Personas improved the quality of ideas in two design teams, but the researchers Bornet and Brangier (2016) could not determine whether personas generate empathy, a finding that echoes Putnam (2010), who found that personas help focus designers on users without necessarily increasing empathy. Professional designers evaluated a product idea less favorably when they empathized with target users (Chung & Joo, 2017). The medium can also have an impact on how useful personas are; interactive personas may help participants produce more original and creative ideas than traditional, paper-based personas (Bonnardel et al., 2016).

Creativity for Self and Others

Several studies have explored how people make decisions differently for themselves and others. Most notably for our research, Polman and Emich (2011) conducted several experiments about how participants develop solutions for themselves compared to hypothetical others. In one task, participants were given seven minutes to draw an alien for a story that either they or another author would write. The results indicate that drawing "an alien for someone else led to a more creative outcome than drawing an alien for the self" (p. 494). In another experiment reported in the same article, participants were assigned to generate gift ideas for themselves, a close other (a family member or friend), or a distant other (a stranger). Paradoxically, the results indicated that participants generated the most creative gift ideas for distant others, about whom they had little information. The authors interpreted their findings through construal level theory, which suggests that individuals consider distant people and events more abstractly, leading to greater insight and creativity. Other studies have similarly shown positive outcomes when choosing for others over the self, an activity which relates to the user-centered mindset required by many design tasks. Participants had more fun making choices for others rather than themselves, and choices for themselves were more likely to reflect the status quo (Polman & Vohs, 2014). Another benefit is that people will pursue more information when making choices for others (Liu et al., 2018). That said, people tend to give more weight to desirability than feasibility when they make decisions for others (Lu et al., 2012).

When participants were asked to choose gifts for multiple recipients, they chose more unique gifts for each recipient, but the gifts were also less appealing (Steffel & La Boeuf, 2014). A meta-analysis by Polman and Wu (2019) found that participants tend to make riskier decisions for others than they make for themselves, though this finding conflicts with Michael et. al. (2019).

Our study is one of the first to combine psychological measures of creativity and decision making with experimental work from technical communication and user experience on the effects of persona use (Friess, 2015). Combining these approaches provides a rigorous methodology to evaluate how personas influence the creativity of designers. User experience has a long history of applying psychological research methods to study UX problems; Robinson, Lanius, and Weber (2018) documented the prevalence of psychological methods in empirical user experience research. For instance, So and Joo (2017) used ideational fluency tasks adopted from psychology to test the effects of personas on creativity. Our goal is to provide additional evidence about the measurable effects of personas to help practitioners decide if these tools are worth their cost and effort.

METHOD

Drawing as a Methodology and the Alien Drawing Task

User experience has identified drawing as an effective, inexpensive tool for unleashing and gathering creative ideas. Our use of drawing as a research method reflects user experience approaches that incorporate drawing for creative purposes. Some practitioners use drawing to produce low-fidelity prototypes during the early phases of rapid prototyping (Virzi et al., 1997; Kangas & Kinnunen, 2005; Brown, 2009; Traynor, 2012). Snyder (2003) endorses paper prototypes because their use "encourages creativity in the product development process" (p. 12). Participant drawings encourage freedom of expression and reveal things users cannot easily summarize in words (Fluery, 2012; Xu et al., 2009). UX designers also use drawing-based brainstorming activities with user focus groups during the early phases of product ideation (Bruseberg & McDonagh-Phillip, 2001; Tohidi et al., 2006; Friedman et al., 2002). Inspired by these studies and others, Poole, Chetty, Grinter, and Edwards (2008) advocate for "the promise of end-user produced sketches as a tool for eliciting information about how users conceive of entities that may be difficult to verbalize otherwise" (p. 456). Technical communication, too, has shown an interest in drawing, both in analyzing the communicative power of drawings (Salinas, 2002; Ross, 2017; Malone, 2019; Yu, 2016; Petersen & Matheson, 2020) and in connecting drawing to the larger practice of *techne* (Salinas, 2002; Moeller & McAllister, 2002). As Northcut and Brumberger (2010) argue, "The productive acts of visually (but without words) representing ideas and experiences are valuable, especially when students have a predisposition toward the written word" (p. 466).

To test the effect of personas on creativity, we adapted an alien drawing task developed by Ward (1994), who conducted several experiments asking participants to draw animals that live on another planet. Across the experiments, results showed that "individuals initially determine that a particular knowledge domain is relevant to the task and then access information from that domain to construct the novel entity" (p. 35). In other words, people tend to draw alien animals with features strikingly similar to earth animals, and thus base their creative decisions on what they already know, following what Ward terms the path of least resistance. Polman and Emich (2011) adapted this alien drawing methodology to evaluate the differences between self and other decision making. In their experiment, they gave participants instructions to draw "an alien for a story that they would later write or, alternatively, for a story that someone else would later write" (p. 494). Their instructions did not specifically ask participants to draw an animal, potentially allowing more creativity in the drawings.

We chose to apply a version of the alien drawing methodology to the study of personas because this activity already has a proven track record in testing the creativity of experimental participants; not only has Ward conducted several versions of the experiment (Ward & Sifonis, 1997; Ward et al., 2000; Ward et al., 2004; Ward et al., 2002), but other researchers have adapted and extended this experimental task as well (Marsh et al., 1996; Niu & Sternberg, 2001; Kharkhurin, 2009; Kozbelt & Durmysheva, 2007). Cockbain, Vertolli, and Davies (2013) used this alien drawing task because it evaluates "creativity in a way

that better emulates the real world" (p. 14), while Goncalo, Flynn, and Kim (2010) used this drawing activity to measure creativity because it "gauges the extent to which people can overcome the constraints of past experience to generate a product that represents a novel departure from existing knowledge" (p. 1487), a type of creativity also required by product designers. The alien drawing task offers several advantages for the experimental study of creativity. This seven-minute activity can be quickly explained and easily scaled to include many participants, allowing us to test our hypotheses with a larger sample size. Aliens can be consistently and reliably coded for creativity based on a specific rubric, as described below. Drawing aliens is both familiar enough for the participants to have domain knowledge but unusual enough to allow their creativity to be influenced by the research variables. Further, the process of drawing an alien for a story to be written in the future mimics the process where personas are typically used: 1) identify the user; 2) understand their needs, expectations, and problems; and 3) create solutions based on knowledge gained about the user.

In this experiment, we also asked participants to draw an alien in seven minutes. We added an additional group beyond Polman and Emich (2011) that tasked participants with drawing an alien for an author described in a persona to determine if access to a persona influenced participants' creativity. We kept both the self and other groups so that we could test the differences in this creative task when performed for the self, a generic other (the abstract author), and a closer other (the author in the persona). Ideally, this methodology would allow us to differentiate the creativity of people designing for themselves, focusing on a generic and unclear user, or designing with specific information about the person who needs their work, as designers in the workplace create products through all of these mindsets. We pilot tested this methodology during a presentation at the 2019 Louisiana Tech Usability Studies Symposium and with our own technical writing advisory board. The study was approved by the UAH Institutional Review Board on July 23, 2019: E201949 for compliance with regulations on the protection of human subjects.

Experimental Methodology

To begin this research, we needed an author persona that we could provide to participants. To base the persona on actual authors, we conducted an online survey that used a convenience sample to recruit seven authors of various genres, including fiction and self-help books. The survey asked authors about their writing motivations, habits, and frustrations. The responses were then synthesized into a persona that represented the author archetype "Amber," represented by a Creative Commons stock photo of a woman working on her laptop (See Figure 1).

To measure the role that personas play in creative expression and design, we created three experimental groups. In the first group, participants were tasked with drawing a space alien for a story they would later write (Self group). In the second group, participants were asked to draw a space alien for an author who would be writing a story, but they were provided no details about the individual (Author group). In the third group, participants were given a persona for the author "Amber" and asked to create an alien that an author like her could use as the main character in a story (Persona group).

Once participants agreed to participate in the study, they were given the directions that corresponded to their experimental group. Each group was given two minutes to brainstorm and write down notes about their upcoming drawing task. Participants drawing for themselves were prompted to write about the kinds of stories and characters they liked. Participants drawing for a generic author were prompted to write about the motivations, needs, goals, and frustrations of an author writing a story. Participants drawing for the persona were asked to read the persona and write down any notes about the motivations, needs, goals, and frustrations of an author like the one featured in the persona.

After finishing the brainstorming task, participants were provided with a wide variety of crayons, markers, pens, pencils, and paper to draw a space alien by themselves during the seven-minute time limit. After the seven-minute time limit, they were asked to stop, number their final drawings, and complete a research questionnaire that collected demographic information, their attitudes about their final drawing, their beliefs about the author or audience they drew for, and their motives in completing their drawing (See Appendix A for the full survey instrument). The researchers collected the brainstorming notes, drawings, and research questionnaires from participants and thanked them for their time.

Participant Demographics

Participants were recruited from a university campus and from a local industry partner that offers cooperative educational work experiences for undergraduate students. The participant group, while limited in age range, provided access to the wide variety of disciplines involved in product development and design decisions, including majors in computer science and engineering (60), business and accounting (37), information systems (15), science and math (14), technical writing and English (13), communication (12), marketing (12), and art (3). Of the 172 participants recruited, 64 were women, 104 were men, and 4 indicated other or preferred not to identify their gender. Thirty-six percent of participants were in their final year of study, forty-five percent were two years from completing their field of study, and only sixteen percent were three or four years away from completing their degree program.

Analysis

We collected 50 drawings from the Self group, 52 from the Author group, and 70 from the Persona group. Four of the authors (Ryan, Joy, Jackie, and Robin) acted as raters and evaluated each of the 172 aliens. To ensure a "firewall" between the raters and the experimental conditions, Candice photographed and prepared the aliens for analysis. The aliens were also given non-sequential numbers so that their identifier was not a

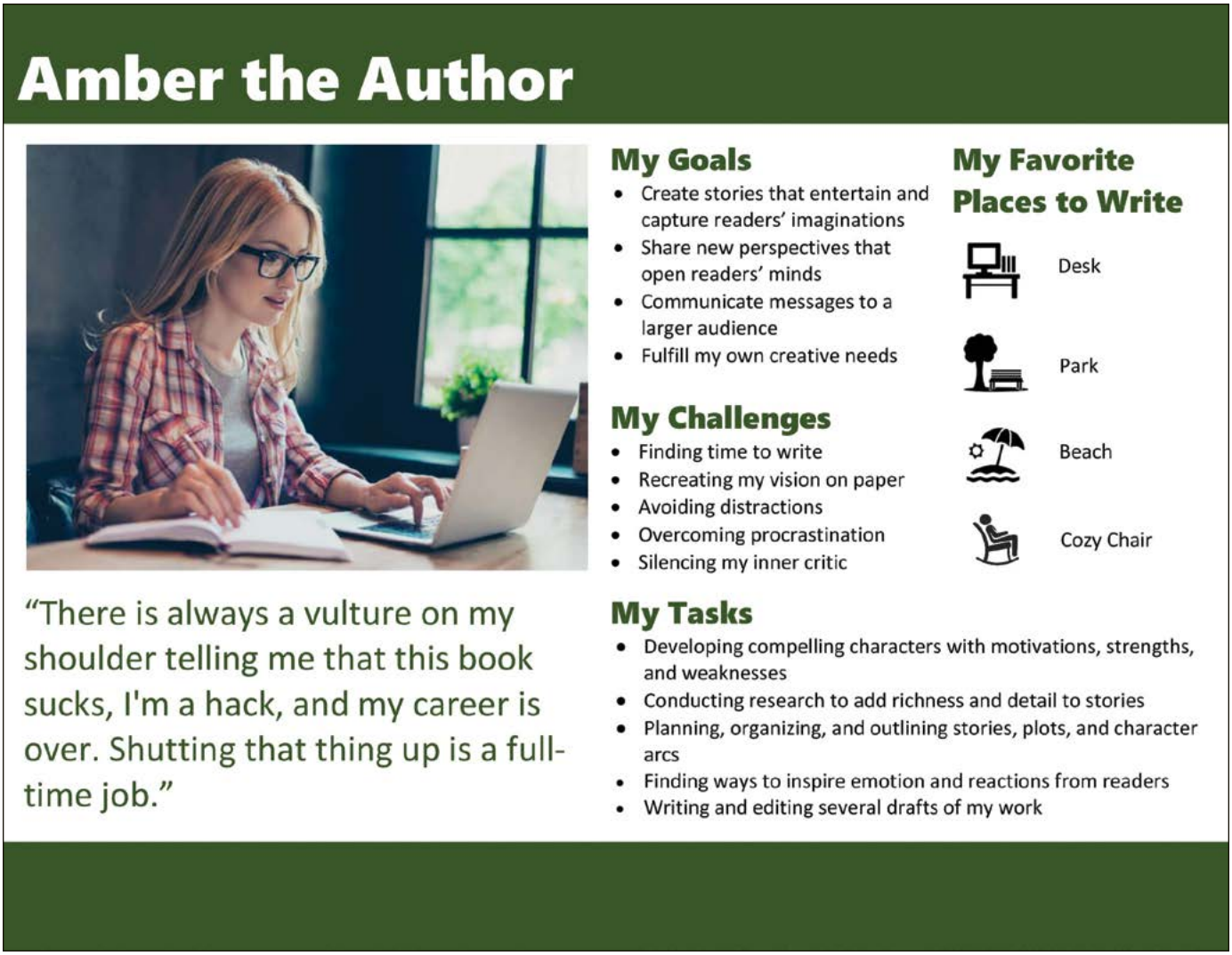

Figure 1. Amber the Author persona

clue to the experimental group that they came from. These steps ensured that the raters did not know which group the alien came from and would rate based on the merits of the drawing without undue influence of the condition. To code the aliens, we generated a rubric that allowed the experimenters to assess each alien on five dimensions:[1]

1) Please rate the alien on creativity from 1 "less creative" to 5 "more creative."
2) Please rate the alien on how surprising or unusual the alien is from 1 "not surprising" to 5 "very surprising."
3) Please indicate the number of atypical features present on the alien (including size) from 0 to 5+.
4) Please indicate how similar this alien is to your knowledge of existing popular culture aliens from 1 "not at all similar" to 5 "identical to a known alien."
5) Please indicate how similar this alien is to an earth animal or human being with 1 "not at all similar" to 5 "identical to an earth creature."

These criteria were developed by first consulting creativity research: Many focus on "divergent thinking" (Sternberg, 2006) which informed rubric items 2 and 4. We also conducted a coding session where the researchers discussed how they would evaluate drawings from a pilot research session. Coders were instructed to consider these pilot aliens as reference points when evaluating each of the drawings for creativity and surprise (items 1 and 2). Rubric items 3 and 5 come from the coding procedure of Ward (1994), Polman and Emich (2011), and Kozbelt and Durmysheva (2007), which considered aliens with fewer humanoid or Earth-like features more creative; thus, an alien with wheels instead of feet would be considered more creative. A novel question not found in existing literature (item 4) was also added after observing several aliens that duplicated or were similar to existing popular culture aliens. Aliens clearly based on existing fictional aliens (such as Marvin the Martian, the alien from the Ridley Scott film shown in Figure 2 below, or stereotypical "gray" aliens) were considered less creative because the participant directly copied an existing idea.

Figure 2. Drawing with low score for duplicating a popular culture alien

Since we were measuring creativity, we avoided rubric items that would focus on execution or aesthetic principles. Coders were also told to consider alien design over the aesthetics of the alien so as to not privilege participants with stronger drawing skills. All drawings were photographed in black and white to avoid raters using color as a criterion for creativity scoring (not all participants had equal access to varied colors for the drawing task). Additionally, because participants were only instructed to draw an alien and not its environment, coders agreed to ignore background details (spaceships, planet vegetation) unless those details provided information on the alien (such as its relative size). Coders normalized their coding process using drawings produced during the pilot sessions of this research.

Once the coding was completed by each of the individual coders, the reliability of the rubric and reliability of the coders was evaluated. The four coders had positive interrater reliability using the rubric with statistical significance (p-value) less than .001 in a Fleiss Multirater Kappa test. The rubric itself had high reliability between the coders for each of the five questions based on a Spearman correlation test. The strong interrater reliability and item correlations indicate that this rubric provides a highly reliable measure of creativity and could be applied as an assessment tool for other experiments.

[1] This coding process was revised to this current form through feedback from the peer reviewers of this article.

Drawing on Personas

Table 1. Correlation scores for rubric questions

	Q2	Q3	Q4	Q5
Q1	.969	.865	.623	.756
Q2		.855	.647	.764
Q3			.529	.741
Q4				.438

In Figure 3, a radial graph shows how these five questions worked together as strong indicators of creativity. Items 4 and 5 were inverted so that the scores were all in the same direction, with 1 being a low score and 5 being a high score.

The green line shows the score of the left most alien below (Figure 4). The non-human shape and non-traditional silhouette made this alien the highest

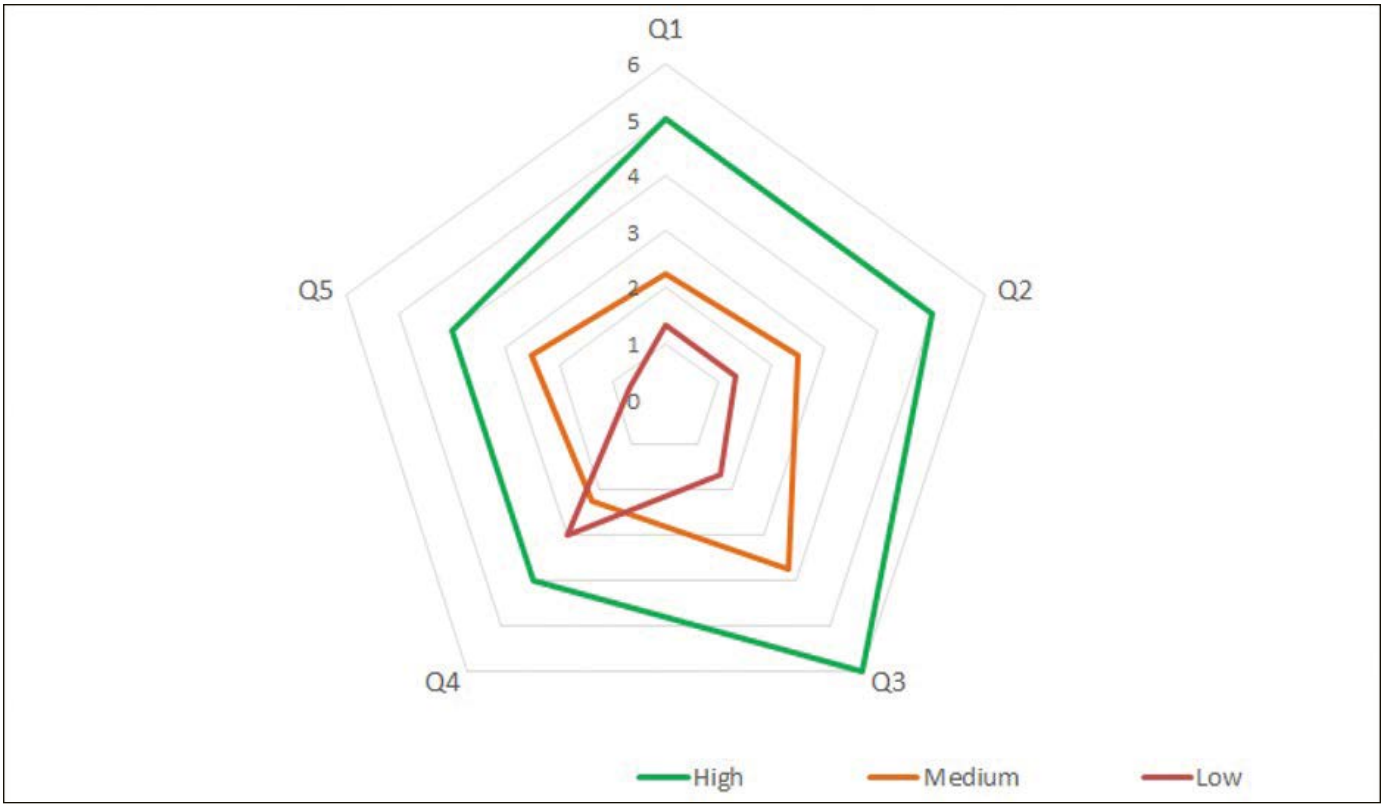

Figure 3. Example scores for high, medium, and low creativity alien

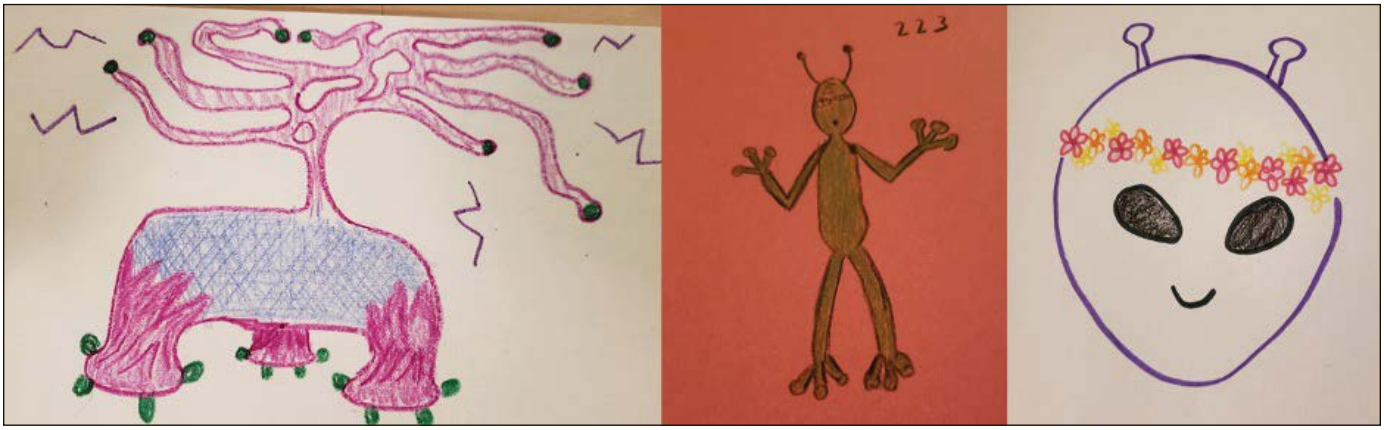

Figure 4. Corresponding aliens for example scores of high, medium, and low

rated in the 172-alien set. The second alien scored in the middle due to some atypical features (three appendages on each hand and foot), but the body shape is humanoid. The alien on the far right, due to its fairly stereotypical face, rated low for creativity, surprise, and presence of non-earthlike features.

When you look at the aliens in "peer groups" clustered by score, the rubric clearly sorted the creative from the uninspired. In Figure 5, the three aliens rated for low creativity using the five-item rubric are almost indistinguishable from regular humans. While the middle alien could have some sort of scales on his torso, it could also be a regular sweater.

Figure 5. Sample of aliens with low creativity ranking

Figure 6. Sample of aliens with moderate creativity ranking

Drawing on Personas

Figure 6 shows aliens with moderate creativity scores. While the aliens are still reminiscent of human figures, the one on the left has an unusual number of arms, two left feet, and two sets of eyes.

The strongest performing aliens shown in Figure 7 are surprising, do not duplicate common fictional aliens, and depart from Earth based animals or humans. The one on the far right, in particular, lacks the sensory organs expected from most earth creatures.

While the aliens were nicely clustered using the rubric as an assessment protocol, it was important to next identify if there were any differences between the aliens based on the participant's assigned experimental group.

RESULTS

To understand if there were statistically significant differences in the data, a series of inferential statistical tests were performed using SPSS 26 (IBM, 2019). The data, tables, and graphs were prepared using Excel. This section summarizes the results of those statistical tests and provides descriptive numbers while the full statistical report can be found in Appendix B.

Figure 7, Sample of aliens with high creativity ranking

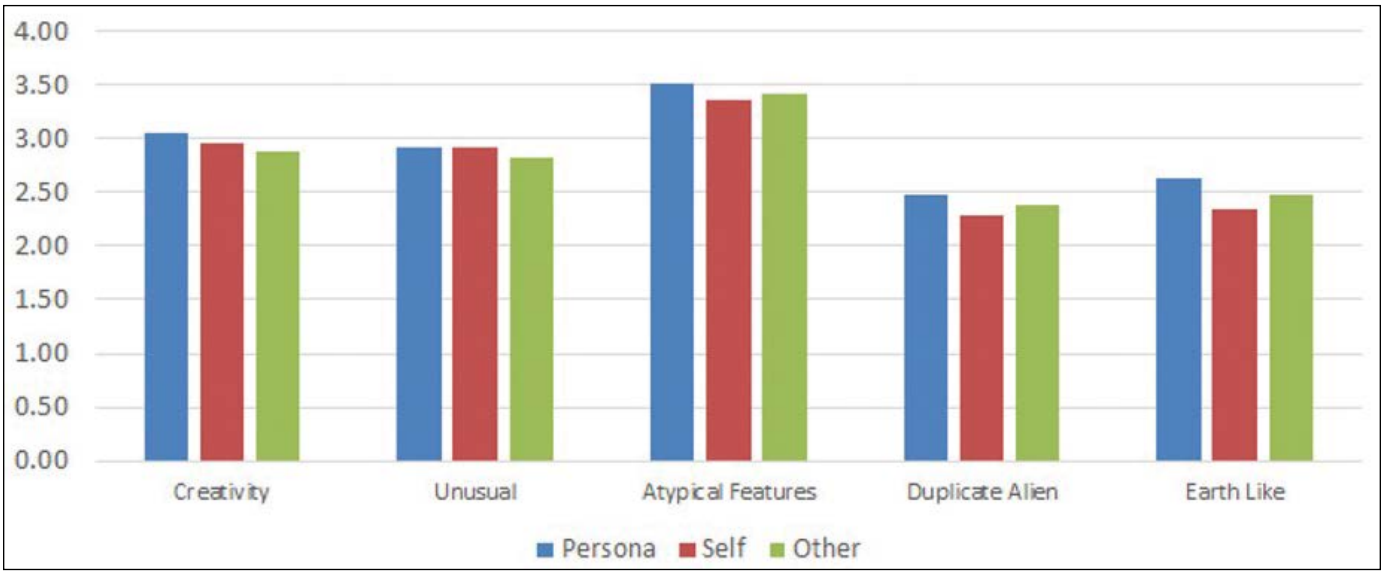

Figure 8. Rubric average scores for Persona, Self, and Other groups

Creativity Ranking of Drawings

A test of difference was performed to see if the three groups—Persona, Author, and Self—had differences in the scores given to the alien drawings by the raters. A Kruska-Wallis test showed that there was no statistically significant difference between the three groups for any of the five questions contained in the creativity rubric. Therefore, the results showed no difference in creativity among the drawings in the three groups. Figure 8 shows the average scores for the three groups. While there are small differences with the persona group slightly higher in all five categories, these differences are not significantly different or substantively different.

Participant Perception of Alien Drawing

There were statistically significant differences in the survey results between the three groups, indicating that participants using the persona had more user-centered attitudes than those drawing for a generic author. Figure 9 shows the substantive differences between the self-reported feelings of the three groups. Those drawing for the persona felt that the author would be satisfied with their drawing more often than those drawing for a generic author. Participants designing with a persona also felt more confident in sharing their drawing than those drawing for the generic author. Confidence that the drawing could be used to write a story increased in the Persona group and Self group compared to the Author group. The participants felt that they met expectations more strongly in the Self group compared to the Persona or Author group. Those who designed for a generic author were more nervous about sharing their alien than participants in the other two groups.

While there was no difference between groups for how much participants thought about the two-minute brainstorming activity while they drew their aliens, within the Persona group, there were numerous positive correlations between referencing the brainstorming activity and positive feelings towards the author and alien itself (Spearman Correlations, $n = 70$, $p < .05$). Table 2 shows a slight correlation for author satisfaction and moderate correlations for empathy, characterization, confidence, desire to please, and

Figure 9. Perceptions of alien and task performance by group

understanding if the Persona group participant used the brainstorming activity as they drew their alien.

There were also negative correlations between thinking about the brainstorming task and having negative feelings toward the alien or author (Spearman Correlations, $n = 70$, $p < .05$). Table 3 shows this relationship; if respondents said they did think about the brainstorming activity as they drew their alien, then they were less likely to self-report confusion or apathy towards their alien.

DISCUSSION

Our results did not indicate that personas increased designer creativity. Instead, all three groups produced alien drawings of similar creativity level. These results are surprising, given that Polman and Emich (2011) found that "drawing an alien for someone else resulted in a more creative alien" (p. 494). Our findings also conflict with many of the other experiments that found positive correlations between persona use and improved product design (Long, 2009; Miaskiewicz et al., 2009; Ma & LeRouge, 2007; So & Joo, 2017; Bornet & Brangier, 2016; Dahiya & Kumar, 2018; Buisine et al., 2016). There are multiple possible explanations for these findings. For one, other studies used different metrics to evaluate the products produced through persona use. For instance, others have conducted expert reviews to measure the user-centeredness of designs created with or without the aid of a persona (Long, 2009; Ma & LeRouge, 2007; Miaskiewicz et al., 2009). Alien drawings are more difficult to rate with a user-centeredness heuristic, though, theoretically, authors or other experts could evaluate how usable the drawings were for the purposes of creating a story; such ratings might produce different experimental results.

Other differences in research procedures may also explain the differing findings. For instance, So and Joo (2017) specifically note that their sample size may have affected their results. Additionally, some of these studies test the effects of personas on design within teams (Long, 2009; Buisine et al., 2016), while our study focused on the impact of a persona on one participant's creative output. Bornet and Brangier (2016) specifically note that "personas didn't generate more ideas. They increased the argumentative activity and language simulation. It is clear that personas promote cooperative dialogue, which would enable increased efficiency in the idea selection process" (p. 255). These findings echo

Table 2. Positive correlations between persona brainstorming activity and attitudes

	I thought about the two-minute brainstorming activity as I drew my alien.
I felt empathy toward my alien as I drew it.	.400
I think that the persona author would be satisfied with my work.	.292
I think this alien would make a good character in a story.	.330
I feel confident that the author from the persona could use this alien to write a story.	.332
I thought about what the author from the persona would want when I created this alien.	.768
I really wanted my alien to turn out well to satisfy the expectations of the author from the persona.	.376
I understood the reasons why the author from the persona needs this alien.	.486

Table 3. Negative correlations between persona brainstorming activity and attitudes

	I thought about the two-minute brainstorming activity as I drew my alien.
I did not understand the plans the author from the persona had for this alien.	-.248
I did not care about my alien.	-.369
I did not think about the persona as I drew my alien.	-.697
I was confused about why I was creating this alien.	-.447

many ethnographic findings that personas benefit idea communication more than idea generation (Rönkkö, 2005; Matthews et al., 2012). Testing the use of personas in teams potentially produces different results than testing personas on individuals. The increased creativity of personas may result from their use as team brainstorming tools.

Another possible explanation for our findings is that personas are not equally helpful for all creative tasks. Perhaps personas increase creativity and designer effectiveness more noticeably in more blatantly design-focused tasks and tasks that have very specific design parameters, such as website development, than in less pragmatic tasks such as the seven-minute alien task. Personas may also benefit designers more in long-term design projects that require sustained engagement and consideration of user needs. While increasing creativity is a widely cited and tested benefit of persona use, some creative tasks may benefit more from persona use than others.

Despite our overall creativity scores suggesting that personas did not increase creativity on this task, our findings do indicate that personas offer benefits, especially when it comes to generating user-centered perspectives. Personas increase confidence, to the point where persona-using participants became as confident as those who drew an alien for themselves. Personas may also increase audience focus by making designers more excited to share their work with its intended user. Participants in the Persona group were most excited to share their aliens, suggesting that the concrete audience created by a persona increased their enthusiasm for their work and a connection with their user.

A more fine-grained analysis of the data suggests that actually referencing a persona during design increases user-centered attitudes that aid creativity. Just because designers receive a persona does not mean they will use it (Rönkkö, 2005; Matthews et al., 2012; Friess, 2012). Designers may ignore it in favor of their own preferences or other decision aids. In our experiment, not every participant in the Persona group reported thinking about their persona as they drew their alien. However, participants who reported thinking about the persona during the brainstorming task had higher self-reported scores on a number of other positive metrics: They felt more empathy toward their alien drawing, more confident that the author could use the alien in a story, more confident that the author would be satisfied with their work, more likely to believe that their alien would make a good character, more likely to think about the author as they drew, more likely to want to satisfy the author's expectations, and more likely to understand the author's reasons for needing the alien. Inversely, participants in the Persona group who reported not thinking about the persona brainstorming activity were less likely to understand the author's plans for the alien, less likely to care about their alien, less likely to think about the author while drawing, and more confused about why they were drawing the alien. Of course, confidence in a design does not automatically mean that the design better meets user needs. Still, these correlations suggest that personas can deliver some of their promised benefits by increasing the confidence and investment of designers and prompting them to think more about their intended users. With these findings, our study closely mirrors results from Friess (2015), who found that while personas did not increase performance on a usability heuristic evaluation, they did increase "the user-centric language of the recommendations" and make heuristic evaluation a "more user-centric endeavor" (p. 189). Similarly, our work suggests that personas can prompt user-centered attitudes and perspectives when people actually reference them during design projects.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

This research study contains several limitations worth noting. Our research only tests some of the potential benefits of personas related to creativity, empathy, and confidence. For instance, Cooper (1999) and many other scholars describe personas mostly as a team discussion tool and decision aid. By having participants work on their drawings individually, we do not test the capacity for personas to guide group communication and whether personas improve group decision making. Further, our sample population suffers from the same bias as many academic studies in that it relied on college students as participants. College students tend to skew younger, and some researchers (Galenson, 2006) have suggested that creativity differs between young and old individuals. Including a wider age-range among participants could change the study results.

There are several possibilities for future research into the value of personas and their impact on

designer creativity. Our research intentionally excluded participants familiar with personas from the Persona group. However, researchers could test the effects of personas on creativity with both expert and novice persona users to determine how they use personas differently and the effects of personas on their designs. Additionally, researchers could test the creativity effects of different types of personas, such as paper-based, video, and interactive (Bonnardel et al., 2016; Bonnardel & Pichot, 2020). Several studies have also offered ideas for improving traditional personas (Cabrero et al., 2006; Cabrero et. al., 2017: Meloncon, 2017), such as user-generated personas (Cabrero, 2015) or personas that emphasize embodiment and mobility (Meloncon, 2017), so future researchers could test the effects of these approaches on creativity. Finally, there are questions about the impact of different industries where design and personas come together: Future investigations might consider the role of personas in a digital media field compared to legacy engineering firms. This study used authors as raters who come from a mixture of academic and user experience backgrounds; using raters from different professions, such as graphic designers or technical communicators, could validate or complicate this study's findings.

CONCLUSION

Our industry authors initiated this experiment to inform their persona use at work and to build the arguments they make about personas to management. The results suggest nuanced benefits to personas, and these results can help practitioners make more judicious decisions and arguments about when and how to use personas. Personas may be better suited for some projects and situations than others. Because they can impact designer confidence, willingness to share their designs, and emphasis on the user, personas might be best deployed on complex team projects that involve long-term product development and maintenance. When deployed as part of a short-term solo project, personas do not appear to be a boost to the final product design. Many projects with a sole technical writer or user interaction designer are constrained by a small budget and a limited timeframe. Therefore, these findings might suggest that personas are not the best use of time or resources for projects with a quick turn-around. As Bødker, Christiansen, Nyvang, and Zander (2014) argue, in short-term projects, "it seems like substantial overkill to develop complete personas" (p. 99). On the other hand, projects that require developing sustained empathy with the user and involve team members with varied perspectives could benefit from the investment into personas as part of the design and writing lifecycle. While personas are not a replacement for interfacing with users, teams that are eager to meet with their customers but have difficulty accessing them would be more likely to benefit from having personas. This is especially true in complex projects involving customized, novel solutions as opposed to those that require templated solutions to problems.

Further, our results confirm that personas only increase user-centered attitudes when designers actually reference them in design tasks; teams cannot hang personas around the office and expect them to instantly enhance user-centered design. Personas that end up on the shelf (Brown, 2010), hung up but ignored (Blomquist & Arvola, 2002), or barely referenced in conversation (Friess, 2012) are not worth creating. Therefore, the willingness of team members to use personas during their work would influence the decision whether or not to create them. Technical communicators and UX interaction designers also need to develop strategies to encourage persona use to see their full benefits. The evidence gathered here can be used to encourage other team members to reference personas as part of promoting a genuine user-centered culture in teams and corporations. Referencing personas provides a whole host of psychological effects that can focus designers on users.

Because personas generate user-centered attitudes, technical writing and UX professionals can also use them to justify their own organizational legitimacy. Technical communicators prove their value through user advocacy (Martin et al., 2017). Our own findings affirm Rose and Tenenberg's (2017) assertion that personas help user-centered professionals validate their role:

> the use of personas is not random, natural, or inevitable, but rather a strategic rhetorical gambit by UX practitioners for gaining legitimacy within their organizational contexts: In speaking with a user's voice, the UX practitioners make the user present, and in this way, bulk up their own presence at the decision-making table. (p. 171)

Creating personas and referencing them to increase user-centered design shows design teams and management how technical communicators can contribute to organizations. While not an easily quantifiable business measure, cultivating user-centered attitudes can improve a corporation's relationship with its customers, lead to better products, save the business money, and generate more profits in the long term. When used, and used thoughtfully, personas can enhance user-centered attitudes among designers, enhancing the status of technical writers and UX professionals as well.

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APPENDIX A: RESEARCH QUESTIONNAIRE

1) What is your major?
2) In what year do you plan to graduate?
3) What is your gender?
4) (For Persona Group) How familiar are you with user personas?
5) Please circle any hobbies that you often participate in during your free time:

   Reading, Fishing/Hunting, Painting/Drawing, Watching Movies/TV, Hiking, Playing Video Games, Listening To or Playing Music, Watching/Playing Sports, Playing Cards/Board Games, Biking, Running, Traveling

Please answer the following questions on a 1-5 scale, where 1 = strongly disagree and 5 = strongly agree.

6) I am pleased with the results of my drawing.
7) I felt empathy toward my alien as I drew it.
8) I would like to read a story featuring the alien I drew.
9) I did not care about my alien.
10) I would like to share the drawing I did with others.
11) I think this alien would make a good character in a story.
12) I feel confident that I could use this alien to write a story.
13) I did not have a plan for creating my alien.
14) I thought about what I wrote down during the brainstorming activity as I drew my alien.
15) I did not think about the kinds of stories I like to read when I created this alien.
16) I did not know why I was creating this alien.
17) I struggled to draw my alien.
18) I do not think I could use this alien to write a story.
19) I would be nervous about showing my alien to someone else.
20) I understood the reasons why I was creating this alien.
21) I really wanted my alien to turn out well to satisfy my own expectations.
22) I was confused about why I was creating this alien.
23) I was not pleased with my final alien drawing.
24) I can predict how well readers would like the alien I have created.

Open-Ended Questions:

25) What were your goals in creating this alien?
26) What influenced or inspired the ideas you came up with for this alien (examples might include TV, movies, science fiction books, scientific discoveries, the brainstorming activity, etc)?
27) (For Persona group) Did the persona influence your decisions in drawing your alien?
28) If the persona **did** influence the decisions you made in your drawing, what decisions did it influence?
29) If the persona **did** influence the decisions you made in your drawing, please circle the parts of the persona that you found most helpful.

APPENDIX B: APA INFERENTIAL STATISTICAL TEST INFORMATION

Kruskal-Wallis Tests of Difference:

- No statistically significant difference between persona, author, and self groups for Rubric Q1: "Please rate the alien on creativity from 1 "less creative" to 5 "more creative."
  - Persona m = 3.05, self m = 2.95, other m = 2.88; Kruskal-Wallis H (2) = .434, p = .805.
- Rubric Q2: "Please rate the alien on how surprising or unusual the alien is from 1 "not surprising" to 5 "very surprising."
  - Persona m = 2.92, self m = 2.93, other m = 2.83; Kruskal-Wallis H (2) = .285, p = .867.
- Rubric Q3: "Please indicate the number of atypical features present on the alien (including size)."
  - Persona m = 3.52, self m = 3.36, other m = 3.41; Kruskal-Wallis H (2) = .131, p = .936
- Rubric Q4: "Please indicate how similar this alien is to your knowledge of existing popular culture aliens from 1 'not at all similar' to 5 'identical to a known alien.'"
  - Persona m = 2.47, self m = 2.3, other m = 2.38; Kruskal-Wallis H (2) = 1.473, p = .479
- Rubric Q5: "Please indicate how similar this alien is to an earth animal or human being with 1 'not at all similar' to 5 'identical to an earth creature.'"
  - Persona m = 2.63, self m = 2.35, other m = 2.48; Kruskal-Wallis H (2) = 1.482, p = .477.

Mann Whitney Tests of Difference:

- Author satisfaction for persona (m = 2.85) was greater than author (m = 2.28); U (n = 122) = 1348.5, p = .012.
- Confidence in sharing the drawings was higher for persona (m = 3.19) than author (m = 2.44); U (n = 121) = 1275, p = .006.
- Confidence that the drawing could be used to write a story increased with the persona (m = 3.66) and self groups (m = 3.66) compared to the author group (m = 3.13); U(n = 122) = 1410, p = .028; U (n = 102) = 997, p = .037.
- Met expectations was greater in the self group (m = 3.7) compared to the persona (m = 3.17) or author (m = 3.02) group; U (n = 120) = 1305, p = .015; U (n=102)=933, p = .012.
- Nervous about sharing their alien was greater in author (m = 3.43) compared to self (m=2.48) or persona (m=2.6): U (n = 122) = 1248.5, p = .002, U (n = 102) = 817.5, p = .001.

Incorporating Social Science, the Fine Arts, and Technical Writing: A Case History at Publishing Concepts (PCI)

By Carla T. Kungl, M. Blake Hargrove, and Debra F. Hargrove

ABSTRACT

Purpose: The purpose of this article is to present a case history of one company's project to refine and define its core values statement. In this case, the company chose to employ both traditional technical communication technique and the fine arts of creative writing, graphic design, photography, and illustrating.

Method: This article provides a detailed description of the process that one company employed to update an existing core values statement. It also provides the reader with specific guidance on the company's process including the use of social science tools and the inclusion of fine arts.

Results: The results of this case history document the production of two specific cultural artifacts, a booklet and a book, which demonstrate the purpose and efficacy of using a combination of technical writing and the fine arts to produce artifacts that both convey meaning in a technical sense and evoke emotion in an aesthetic sense.

Conclusion: The intentional use of the fine arts can help a company create a core values statement that becomes an important cultural artifact and can help employees not just understand their role in that business but to also see how they are valued as part of it. Technical writing faculty should encourage students to incorporate creativity, and technical writing practitioners can use the artifacts developed in this case study as examples of work that can be produced through the intersection of the fine arts and technical communication.

Keywords: technical communications, fine arts, core values, creative writing, social science

Practitioner's Takeaway:

- Provides an informative process for other organizations
- Employs social science tools to minimize bias and guesswork, and to maximize employee input
- Demonstrates the need for companies that wish to make their values a cornerstone of their operations to make a significant investment in producing high quality artifacts
- Adds to the growing body of technical communication literature that values artistic creativity

Carla T. Kungl, M. Blake Hargrove, and Debra F. Hargrove

Developing and documenting the defining statements for a business, including its core values, can be a tough proposition. One can picture the process a well-meaning company might run through: Its people sit through meetings, hammer out words, hash through iterations. If the company is lucky, those people working on creating core values are not just those at the top but folks throughout the organization who feel like they have a say. And if it is really lucky, those words on the page that become core values actually mean something to the company and the people working there.

Unfortunately, this is where many companies stop: They did the work, had the meetings, and the finished product sits on a shelf for anyone to pick up or read in the employee handbook (see, for instance, Lipton, 1996; Jawahar & Gavin, 2003). A few glossy posters might be tacked up in the hallways here and there. But writing a set of core values should do more than check off a box under "good business practice." This article suggests a path forward using creative and cooperative invention to revitalize a business' core values statements, using the example of Dallas-based PCI, a mid-sized high-growth organization that specializes in creating alumni directories. Its authors, a technical writing professional and professor, a business consultant and professor who worked with PCI first-hand, and a human resources specialist whose job success requires incorporating and interacting with core values, see this company's process of creating core values statements as not just successful for PCI but informative for other businesses.

The authors describe in this article a case history that illustrates the successful relationship between technical communication, other artistic creativity, social science, and business practice. The PCI team's interdisciplinary approach incorporated the fine arts of writing and graphic design beyond their more traditional uses in technical communication, with the eventual deliverables, a 24-page *Redbook* and an 80-page *Blackbook,* showcasing how artistic creativity can invigorate a company's typically mundane values statements.

In the rest of this article, the authors discuss literature on creating core values statements and on the intersection between technical communication and the fine arts. We provide a broader overview of the company, PCI, and detail the methods used in the case. After briefly discussing some results of the project, we conclude with the implications of this case for other businesses and for practitioners or professors of technical communication in general. As a whole, the case history suggests a method of developing a core values statement that can successfully help a company's workforce envision how they can interpret and live out those values. Additionally, the products that result from the creative process can be more successful if nontraditional artistic elements are incorporated into them. Lastly, this article adds to the recent body of literature in the technical communication field that supports reconnecting and revaluing the creative and innovative thinking that undergirds the technical communication field.

INTRODUCTION

This section provides a brief overview of Publishing Concepts Inc., the company where one of the authors worked to help revamp its core values statement. Next, it includes literature reviews on core values statements and creativity in technical writing. We look to lay the groundwork for understanding how this project combines solid business practice with creativity in technical communication.

About PCI

The Core Values Project that lies at the heart of this case study took place at Publishing Concepts Inc. (PCI) during 2019 and 2020. PCI is the national leader in directory and association directory publication. The company has experienced rapid growth over the past decade, moving from approximately 80 employees and 10 million in sales to 350 employees and 48 million in sales. During the same growth period, the company has consistently been named as one of the best companies to work for in each of its four principal locations: its original Dallas location and its additional offices in San Antonio, Texas; Virginia Beach, Virginia; and Little Rock, Arkansas. These honors are based on anonymous third-party surveys completed by the employees at all participating companies, with employee engagement and satisfaction the main determining factors. The company's growth and accolades over the past five years indicate the high esteem it holds among its employees.

PCI is an intentional organization, meaning that every aspect of the company in both policy and practice is purposefully and proactively designed rather than organic or reactionary. This especially includes its organizational culture. Drew Clancy, PCI's president

and CEO, understands his role to be the visionary for the organization, and most of his in-house time is intentionally spent on culture-building, rather than on operational activities. During late 2018 and 2019, under Clancy's leadership, PCI reviewed and revised its 2008 core values statements, as Clancy believed they no longer reflected the company's current culture. His desire to revisit these statements bears out research that such statements have a positive effect on the longevity of successful companies, helping them make effective decisions and lead to an organization's success (Lipton, 1996; see also Evans, 2005; Allio, 2006). In his opinion, culture is PCI's principal source of competitive advantage and guides the company in every aspect of their business activity (see Figure 1). In fact, the entire "core values project" at PCI—from systematically gathering input from across the organization, to clarifying the meaning of the core values, to creating deliverables based on them—is a reflection of the company's desire to train employees on the unique corporate culture of the company. In undertaking the core values project, the CEO invested significant time and financial resources in making sure he helped build a culture that employees could see themselves a part of.

At the end of a nearly three-year process and with the assistance of one of the principal authors of this article (who was employed as Associate to the President for Culture), PCI produced two deliverables. The first publication, the *Redbook 2.0*, is a short 24-page graphic-intensive booklet designed to facilitate orientation sessions, to be placed in the hands of each PCI associate (PCI's term for employees). It is also available in each conference room to serve as a consistent reminder of the importance of culture to PCI, and it serves to represent PCI's culture to outside stakeholders. The second deliverable, the *Blackbook*, is an 80-page hardcover work designed as a training document with a deep level exploration of the core values. Each of the *Blackbook*'s five sections, one for each value, contains explanations of the meanings of the key terms in each of the values, a deep level explanation of each supporting sentence, an original story that epitomizes the support sentences, and an illustration for each of those stories. In total, the *Blackbook* contains more than 13,000 words of technical writing explaining the statements and terms and an additional 9,000 words of creative writing in the form of company stories that bring these values to life. For each of the stories, photographs and other artwork complete the work. These artifacts flex the boundaries of creative and technical writing in the workplace and helped PCI develop core values that reflect their company's culture and embody its philosophy.

Developing Core Values Statements

Though there is abundant popular literature on the importance of a company having vision, mission, and values statements, there are very few articles in academic journals from the business and technical communication fields specifically on writing or revising core values statements. Articles from the 1990s and early 2000s discuss core values in terms of a company's "ethics" (Milton-Smith, 1995) or "corporate responsibility" (Were, 2003). Lipton (1996) offers an excellent discussion on the importance of writing a vision statement and ties "consistent, clear, and shared values" to the effectiveness of an organization and the satisfaction of that organization's employees (p. 88).

But it wasn't until after the Enron scandal and the ensuing passage of the Sarbanes-Oxley Act that companies took seriously the idea of creating core values statements, not just for exhibition to those outside the company but as an integral part of good business practice (Cady et al., 2011). Manohar and Pandit (2014) give an excellent idealistic overview of what a company's core values should be: "these values and beliefs form the philosophy and ideology of the organization, and define the purpose, mission, and long-time commitment of the organization. An organization's core values reveal what the organization stands for" (p. 667; see also Kaplan et al., 2008). Additional literature on the ways that companies use or develop core values range from how core values might help a company innovate (Manohar & Pandit, 2014); how they can encourage conversations among employees and thus help them live out those goals at the workplace (Björkvall & Nyström Höög, 2019); and how more organic core values, as opposed to "mechanistic" ones, help managers in the business sector (Jin & Drozdenko, 2010) and the financial sector (Jin et al., 2012) feel a stronger sense of social responsibility. Wæraas' (2015) study of federal agencies show that these agencies prefer to develop "soft" values such as integrity and respect to express their identities.

The challenge with these organic, soft, conversation-provoking values statements is that they still have to translate into something livable for employees. How

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Figure 1. "5byFIVE" PCI's culture on a page

do you help companies and employees SEE those values in action? How do companies create and live out their codes of conduct or their core values? Again, there are very few articles that discuss how businesses might develop a meaningful and understandable core values statement (exceptions include Kaplan et al., 2008; Marcus & Roy, 2019; Shapiro, 2016). The path taken by PCI was to combine social science practices to involve the company's associates in developing the core values with the creation of artistically-imbued artifacts that both exemplify and embody the core values that were created, underscoring the connection between technical communication and artistic creativity.

Creativity in Technical Writing

There is ample space in business practice and in technical writing for creative thinking, creative processes, and creative production. Of course, there remains a difference between strictly "technical" writing, which we know must be honest, conveyed with clarity and accuracy, etc; and "creative" writing. An early piece on the knotty distinction, VanDeWeghe's (1991) article muses on the importance not just of definitions between technical and creative writing but how we should use these terms to reimagine what our field does: "Writing technical documents and writing poems is not the same thing," he argues, but we need to see ourselves as more than "'mere technical writers'" as we describe to others the creativity that occurs on the job (p. 298; see also Raymond, 1981; Wight, 1985; and Rutter, 1985 as other early examples of this exploration).

But these early articles are outliers in their appeals to technical writers to embrace creativity and remember the fullness of writing practice. More recently, however, there have been louder calls to re-examine and reclaim the imaginative work that must go on behind the scenes, in the highly relevant inventive processes that stem from rhetorical thinking and that both technical and creative writers must practice (of which this special collection is an example). Several recent articles on workplace writing suggest ways that teachers of technical communication can help students embrace creative elements as they move forward (Zhang & Kitalong, 2015; Brady & Schreiber, 2013). Bekins and Williams (2006) provide advice similar to VanDeWeghe's (1991) from fifteen years earlier on how technical communicators should present themselves to others at work: "We must adopt language that more explicitly (and accurately) positions us as creative workers" (p. 289). Moeller and McAllister (2002), though they reject the model of students as "workers in training," argue that teachers of technical writing need to reclaim "techne" as a creative force in the classroom and help students understand that creative processes undergird technical writing. They issue a forceful call to arms: "So, let us be forthright and idealistic about whom technical communicators are; they are artisans. They work under a variety of constraints but are not determined by them because they are liberated through their creativity" (p. 204).

As further relates to the project at PCI outlined here, articles examining visual rhetoric and how it is understood, incorporated, and used in the workplace by technical writing practitioners abound. Portewig (2008) focuses specifically on how invention techniques drive the creation of the visuals (rather than the writing) that result from the inventive process. Harrison (2003) notes the immense increase in visuals that technical writers have been asked to produce and offers social semiotics as a framework for understanding how images and text work together. Several articles also examine the ways humans understand and interact with visual imagery: through multimedia museum exhibitions (Kitalong et al., 2009; Kim, 2005); in aviation graphics (Mara, 2009); through cinema (Gillette, 2005); or through Internet graphics (Rawlins & Wilson, 2014).

Sam Dragga's (2011) article on building dialogic codes of conduct effectively brings these two strands—of creative technical communication and business practice—together. He discusses how illustrations can communicate aspects of a business's code of conduct as one of five important factors, citing research that discusses the importance of visual rhetoric to communicate not just factual information but also emotions, ethics, and morality.

Similarly, our case history of how PCI revamped its core values statement provides an excellent example of what artistic creativity can look like in contemporary technical communication practice, examining specifically the visual rhetoric that was created to impart the company's vision. Moving beyond the traditional products that emerge from writing or rewriting core values, PCI developed two stand-alone booklets that incorporated both the standard graphic design elements inherent in much technical communication as well as

creative writing, narrative, photography, and drawing and illustration.

METHOD

The following section details the procedure PCI used, incorporating social science techniques, visual artistry, and creative writing, to first understand how associates collectively saw the company's core values and then to how best communicate those values. In part because of the collaborative and truly "inventive" way the Associate to the President for Culture (APC) helped lead the company members through revising their core values statement, the CEO was inspired to go beyond a traditional bare-bones statement in an employee handbook. Instead, the CEO made the business and artistic decision to create two publications as artifacts of the PCI corporate culture. The publications themselves are exemplars of the intersection between technical writing, graphic arts, and creative writing.

Incorporating Social Science Techniques

Here, we describe the survey and focus groups the APC used to help senior management get a sense of how employees at PCI understood and felt about the company's current core values statement.

Survey

Upon being engaged at PCI, the APC was provided with Core Values Statement v3.1, which included the following five values: Pursue Excellence Purposefully, Unlock Human Potential, Act with Integrity, Innovate a Culture of Relationships and Fun, and Lead with a Servant's Heart. These values were established during 2018 by a process that combined input from top leadership and long-time associates. Core Values v3.1 had evolved from a previous value set that was established in 2008. The name indicates that it was an iterative process with a v2, a v3, and a v3.1. Senior leadership was thoroughly pleased with these five values and instructed the APC to leave them untouched in any revisions.

Each core value was accompanied by a brief support sentence, but senior leadership was not fully satisfied with these. Specifically, the CEO felt that the sentences did not reflect the meaning of the values themselves; nor did they reflect the way rank and file associates understood the values. Thus, the purview of the revision was not to develop new core values but to determine how employees understood the core values statement and to develop support sentences that better reflected the meaning of each value. The APC, a trained social scientist, chose to take an investigatory approach to examining the existing Core Values v3.1 (Gilner et al., 2011) and developed a survey instrument designed to quantitatively assess the following research questions:

1. Do PCI associates recognize the existing core values?
2. Do PCI associates recognize the existing support sentences and associate them with the coinciding core value?
3. How do PCI associates define each of the key terms contained in the core values?
4. How do PCI associates see, or not see, the core values being enacted?

The use of a primarily quantitative approach was balanced with the use of focus groups to do qualitative sense-making of the quantitative data (Phillips et al., 2016; Cerulo, 2018). In addition, the APC intended

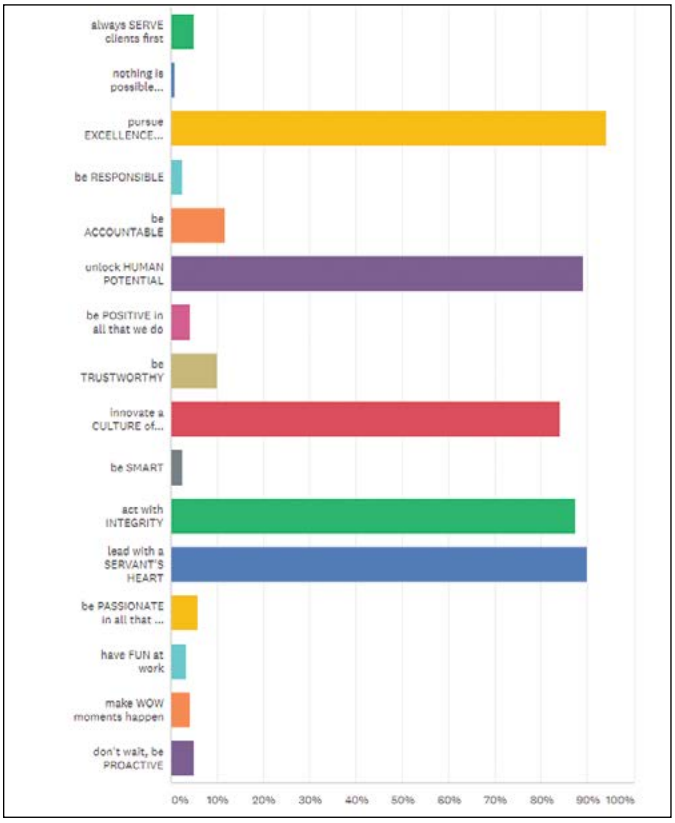

Figure 2. "What are PCI's Five Core Values?"
Note: Colors of bars have no significance

Revising a Core Values Statement

to rely on quantitative data outputs, such as charts and graphs, that he felt would be more easily understood by the focus groups. Finally, in the final sections of the survey, to explore the fourth research question, respondents were asked to provide open-ended, qualitative responses.

The CEO provided the APC with 200 names and emails (out of approximately 400 associates) whose tenure was greater than six months and who thus had some familiarity with PCI culture. Because of the selection bias in sampling, the generalizability across the company was compromised. It would have been more desirable to sample the entire associate population, but the CEO made a business decision to select approximately half based on two factors. First, the surveys were taken "on the clock," so selecting half of the population was approximately half as expensive. Second, he felt that the opinions of associates with longer tenures were more likely to be enculturated at PCI. Because no control group was employed and only half the associates of the company were invited to participate, all results represent the respondents rather than the organization as a whole. In other words, without further testing, it is not possible to determine whether the survey's results were generalizable across the whole organization.

Among the 200 associates who were sent the survey, 126 (n=126) opened the email and began the survey (63% gross response rate). Of those 126, 89 completed the survey entirely (44.1% complete response rate) and 37 made partial responses. These response rates are reasonable given that the survey was voluntary, took on average more than 30 minutes to complete, and diverted associates from their normally assigned duties. Respondents were first asked to provide their tenure at PCI, their job, their ethnicity, and their sex (male or female were the only options, per the CEO's decision). Table 1 is a summary of the demographic results. These results indicate that the survey reached a diverse sample of the population; the People Department (Human Resources) confirmed that these results approximated the demographics of the organization. Taken together with the survey response rate, this provides some evidence that the sample reasonably represented the population of PCI associates with greater than six months tenure.

Following the demographic portion of the survey, participants were asked to respond to a number of items. To elicit information for the first research question, associates were asked to identify the five current values at PCI, choosing them out of 16 phrases often used at PCI. Figure 2 presents a graphic representation of the results of this portion of the survey; Table 2 presents the overall "penetration rate" of the five values among the respondents. These results indicate that a majority of PCI associates responding (>81.7%) were able to identify the five values.

For the second research question, respondents were asked to match 17 existing support sentences with

Table 1. Sample demographics

Description	*n*	%
Female	71	56%
Male	46	37%
no answer	9	7%
	126	100%
African-American or Black	27	21%
Asian or Asian-American	2	2%
Hispanic or Latino not of African Descent	15	12%
Hispanic or Latino of African Descent	4	3%
White or of European Descent	47	37%
Biracial or Multiracial	6	5%
Prefer not to answer	25	20%
	126	100%

Table 2. Penetration rate

Description	*n*	Correct %
Pursue excellence purposefully	116	92%
Unlock human potential	110	87%
Act with integrity	108	86%
Innovate a culture of relationships and fun	103	82%
Lead with a servant's heart	111	88%

one of the associated five core values. For example, the support sentence "We require complete honesty and integrity in everything we do" would correctly match with the value "Act with Integrity" and would incorrectly match with any of the other four values (see Table 3 for a summary of the matching results). Results ranged from a low of 22.2% correct to a high of 93.7% correct. Overall, 63.9% of the statements were correctly matched with the corresponding value, providing some evidence that a majority of PCI associates responding to the survey understood which supporting sentences were associated with which value.

The third research question asked respondents to choose synonyms for fourteen key words in the Core Values v3.1 to help them interpret and define those key words: *pursue*, *excellence*, *purposefully*, *unlock*,

Table 3. Matching results

	EXCELLENCE # right	EXCELLENCE % right	UNLOCK #	INTEGRITY #	CULTURE #	SERVANT #	Total # wrong	Total % wrong	n	Missing
Our goal is to build a great and lasting organization.	93	73.8	6	2	14	2	24	20.51	117	9
If it's worth doing, it's worth doing RIGHT.	94	74.6		21		1	22	18.97	116	10
Question the status quo. Act fearlessly.	77	61.1	29	3		8	40	34.19	117	9
		69.8						**28.7**		
	UNLOCK # right	**% right**	**EXCELLENCE # wrong**	**INTEGRITY # wrong**	**CULTURE # wrong**	**SERVANT # wrong**	**Total # wrong**	**Total %I wrong**	**n**	**Missing**
We believe people have the capacity for greatness.	112	88.9	5		1		6	5.1	118	8
Have a passion for making a difference.	45	35.7	44	4	1	20	69	60.5	114	12
Always be learning because work is a place to learn, stretch, dream, GO!	81	64.3	20		11	3	34	29.8	114	12
Value different perspectives and what makes each of us unique.	85	67.5	7		11	3	21	18.3	115	11
		64.1						28.4		
	INTEGRITY # right	**% right**	**EXCELLENCE #**	**UNLOCK #**	**CULTURE #**	**SERVANT #**	**Total # wrong**	**Total % wrong**	**n**	**Missing**
We require complete honesty and integrity in everything we do.	113	89.7	3			2	5	4.2	118	8
Demonstrate transparency, trustworthiness, and authenticity.	107	84.9	7	1		2	10	8.8	114	12
Make and keep commitments.	107	84.9	28	2		4	34	29.8	114	12
		86.5						**14.3**		
	CULTURE # right	**% right**	**EXCELLENCE #**	**UNLOCK #**	**INTEGRITY #**	**SERVANT #**	**Total # wrong**	**Total % wrong**	**n**	**Missing**
Work is an important part of life and it should be fun.	118	93.7					0	-	118	8
Encourage laughter, storytelling, and recognition.	116	92.1		1			1	0.0	114	12
Optimism is a force multiplier. Choose to be positive.	58	46.0	31	18	2	4	55	48.2	114	12
		77.2						**16.1**		
	SERVANT'S HEART # right	**% right**	**EXCELLENCE #**	**UNLOCK #**	**INTEGRITY #**	**SERVANT #**	**Total # wrong**	**Total % wrong**	**n**	**Missing**
Sieze each moment as an opportunity to serve our clients and one another.	100	93.7	12	3		1	16	13.6	118	8
Hold ourselves and each other accountable.	28	92.1	15	72			87	73.7	118	8
Seek to understand. Start by asking, "How can I be of service?"	109	46.0	7	1	1		9	7.6	118	8
We are all leaders. We all contribute to our NotTheBigCompany culture.	85	92.1	7	18		6	31	26.3	118	
		63.9						**30.3**		

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potential, *act*, *integrity*, *innovate*, *culture*, *relationships*, *fun*, *lead*, *servant*, and *heart*. The number of synonyms provided for each key word ranged from 10 ("culture") to 36 ("integrity") with an average of 20 and a median of 18. Respondents could choose two from each set of synonyms. The frequency of choices made by the respondents here in the survey helped the focus groups in the next step of this methodology extract themes from which to build consensus (Figures 3 and 4 are sample results for two of the key terms, *innovate* and *servant*).

Next, the survey returned to an exploration of the second research question. Respondents were asked to rate the alignment of each of the 17 statements with the corresponding core value, using a six-point Likert rating scale: "I *strongly disagree* that this statement is well-aligned with this value," *disagree*, *somewhat disagree*, *somewhat agree*, *agree*, and *strongly agree*. In all cases, more than 80% of respondents agreed or strongly agreed that the statements were well-aligned with the corresponding values.

The final set of open-ended survey items explored the fourth research question. For each value, the survey required two qualitative responses (one positive, one negative), typical of scale development studies (Spector & Pindek, 2016; Loman et al., 2018). The positive formulation for these questions was: "For this question, we are going to ask you to make a mindful response. Please take three deep breaths. Now, take a moment to consider the core value _____ and an example of how you have seen this value in action at PCI. Please close your eyes and take five deep breaths. Okay, now please relate a specific incident of specific action taken by a PCI associate that you believe really exemplifies the core value _____. If you would like, you may use names. Remember, be specific in your response." The negative formulation was identical in all but two ways. It asked for a specific incident "where you or another associate has fallen short of taking an action aligned with that core value" and directed respondents to "not use any names" in their responses. Word clouds were created for all the responses as aggregated for each

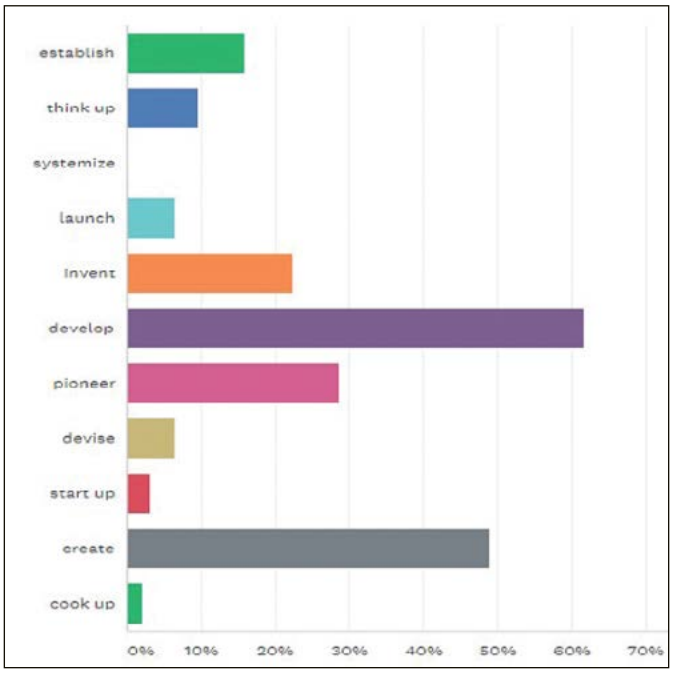

Figure 3. "What does 'Innovate' mean to you? You may select two responses."
Note: Colors of bars have no significance

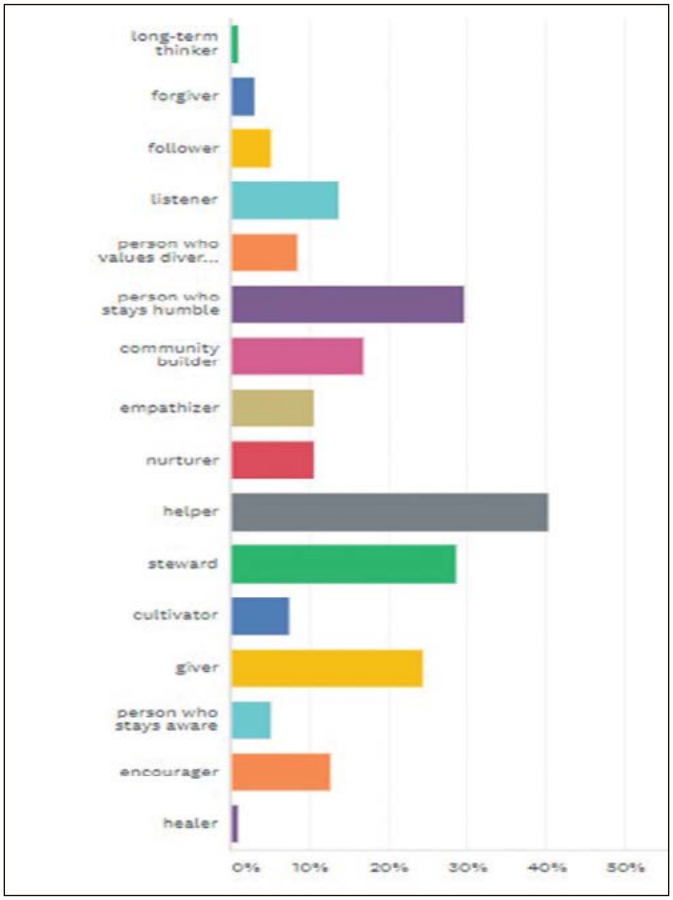

Figure 4. "What does 'Servant' mean to you? You may select two responses."
Note: Colors of bars have no significance

value (see Figure 5 for a sample word cloud for the positive responses to the value "Innovate a Culture of Relationships and Fun"). A text analyzer was also used to identify the frequency of words and phrases found in the aggregated responses (https://www.online-utility.org/text/analyzer.jsp, accessed May 2019).

Focus groups

In order to extract meaning from the quantitative and qualitative data collected and act based upon that data, the APC organized a series of focus groups, sharing the survey data results in a PowerPoint presentation. Focus Group One, which met for four hours, consisted of 11 associates selected by the CEO because of his belief that these 11 associates "got" PCI culture. They were asked about their experiences at PCI in relation to the data collected. In other words, they helped the APC interpret the data collected by using their own institutional knowledge as a lens through which to interpret the findings of the study. These 11 associates actively participated in the sessions and made two key contributions.

The first contribution of the focus group was, as previously noted, its attempt to extract meaning from the data collected in the survey, where respondents selected synonyms for each of the 14 key words. Focus group members discussed the outputs in Figures 3 and 4 given them by the APC, who served as moderator, and tried to build consensus around the meaning of the keyword based upon the similarity of the synonyms and the frequency at which they were endorsed by the survey respondents. For example, for "Innovate," the focus group extracted the themes of create (think up, launch, invent, pioneer, devise, start up, create, and cook up) and develop (establish and develop). For "Servant," the focus group extracted four themes: nurturing, feeling, humble, and aware.

Figure 5. Word cloud for "Innovate a Culture of Leadership and Fun"

Note: Colors of words have no significance

Their second contribution was to develop sentences exemplifying the five core values, having reviewed word clouds (e.g., Figure 5) and reading the words and phrases from the qualitative responses of their peers to guide them.

For example, for "Innovate a Culture of Relationships and Fun," the focus group selected the following phrases to summarize the value:

- "Positivity is a choice. People must choose to be positive and optimistic"
- "Individuality is valued"
- "Create, pioneer, and develop by making the good better"
- "Happiness is a force multiplier. Fun is Contagious"
- "Culture builds great and lasting organizations. Culture is a sustainability strategy"
- "People make relationships; relationships make communities; communities make culture."
- "Work is a meaningful part of life."

Approximately one week later, the APC convened a second seven-person focus group (Focus Group Two), four of whom had also served in Focus Group One. The overlapping membership of the group provided continuity with the work of Focus Group One, and the inclusion of three new people brought fresh ideas and broadened organizational participation. Like the first group, the CEO selected the membership of the Focus Group Two. This group was tasked with (1) reviewing the input and summaries of Focus Group One, (2) evaluating each of the 17 support sentences, (3) scoring those sentences, and (4) making specific suggestions for words that should be used in the final version of the core values statement. Focus Group Two also met for four hours, and their work resulted in specific suggestions as to sentences that should be retained, be revised, and/or be eliminated. Focus Group Two also made some specific suggestions for words that should be used. For example, they felt that the word "love" should be included in a statement supporting the value "Lead with a Servant's Heart." Following this focus group, the APC summarized their findings in a report to the CEO.

Several days after Focus Group Two met, the CEO chose nine associates to work with, all of whom

had served as members of the other focus groups, and convened a final focus group to select or rewrite supporting sentences with him. This group reviewed the recommendations from the APC's report (the APC was not invited to this session) and drafted seventeen support sentences. These statements became part of the final core values statement of PCI and was given the moniker "theFIVE," which was subsequently adopted by senior leadership as PCI's current value statement. The reader will note that theFIVE describes "Who we are?" within the PCI cultural framework (see Figure 1).

Incorporating Visual Elements

Following the adoption of theFIVE, the CEO decided he wanted to produce two publications: the *Redbook 2.0*, a 24-page booklet, and building from it, the *Blackbook,* an 80-page hardcover work. This section provides details of the graphic design, photography, and illustrations employed in the *Redbook 2.0* and the *Blackbook.*

The same attention to detail that marked the process and revision writing of the core values was incorporated into the graphic design required to produce these texts, which were intended to be displayed together, the red on top of the black as a set (see Figure 6). Artists designed the covers, graphic elements within the books, fonts selected, and page layouts all to be congruent and

Figure 6. The Redbook 2.0 and Blackbook as a set

complementary across the two books. For example, the graphic designers chose pointillist waves to represent movement, denoting progress and improvement. These waves appear throughout the *Redbook 2.0* and the *Blackbook* to ensure that the two would reflect one holistic cultural message.

Both the *Redbook 2.0* and the *Blackbook* employ the fine art of photography and photo portraiture. A professional photographer was engaged to take portraits of dozens of associates, where the angles, framing, lighting, clothing, hairstyling, etc. were all intentional artistic choices. From hundreds of alternatives, a team consisting of the CEO, the APC, and PCI's Director of Design selected nine photographs for publication in *Redbook 2.0* and more than twenty for *Blackbook*. Photographs were selected based on aesthetic value and a desire to reflect the age, ethnic, and gender diversity at PCI.

Though color is used throughout the books in deliberate ways, the photographs of the associates are in black and white, which works well for these publications for two reasons. Firstly, black and white photos in general often evoke a feeling of timelessness (see Grainge, 1999, for example). Since the *Blackbook* especially is meant to be a historical document of the process of creating culture, the black and white photos provide that feel of historical authenticity. Secondly, as technical communicators, we understand the power that color has to both reinforce and to distract. Black and white photographs, in part because they are rarer, focus our attention. Kolonia (2016), in his discussion of black and white portraiture, notes how "monochrome can bring the focus powerfully upon the individual, while the distraction of color can pull it away" (p. 53). Thus, black and white photos in the books highlight the importance of each employee at the company, without the distraction of the color of a shirt or a background plant.

Both books also use the fine art of illustration, featuring original pieces for each of the five values and each of the 17 support sentences. To maximize associate contribution to the books, PCI held an all-company design contest for who could best conceptualize two of the core values; the winner, chosen by the CEO, the APC, and the Director of Design, not only won a $500 prize but became the illustrator for that portion of the project. The associate-illustrator, the APC, and the CEO engaged in a series of conversations intended to stimulate the artist's creativity and draw out the CEO's

own aesthetic vision. They arrived at the decision to use allegory rather than literal interpretations of the values and support sentences, in part to avoid a "cartoony" or "hokey" look and feel to the illustrations. For example, for the value Pursue Excellence Purposefully, the conversation revolved around evoking the idea of excellence rather than a figure engaged in a chase. Eventually, the illustrator and the CEO agreed that summiting a mountain evoked that idea and effectively communicated the value, so the associate-illustrator created a series of sketches of mountain climbing until both the CEO and illustrator were aesthetically satisfied. Next, the illustrator transformed the pen and ink sketch into a finished illustration (see Figure 7) suitable for publication. This process goes beyond creating an illustration to simply meet the user's need, a utilitarian use of graphics. Instead, the illustrator could parlay a first-hand understanding of the audience—fellow associates—to "communicate meaning" as part of the shared PCI culture (Rawlings and Wilson, p. 304) and add a personal, human element to what might otherwise be a stock image (see Dragga & Voss, 2000, for discussion of humanizing graphics). An image of a team working together to achieve, with the PCI flag planted at the top of the summit—using PCI-branded colors throughout—all reinforce the company's value of the pursuit of excellence and the PCI culture of teamwork.

Figure 7. "Pursue Excellence Purposefully"

Incorporating Creative Writing

This section showcases the creative writing elements in these artifacts, specifically in the *Blackbook*. While the *Redbook 2.0* reads more like a standard "technical writing" document, presenting the core values statement as developed through the process above, the *Blackbook* stretches typical business communication by using figurative language and storytelling, attributes more typical of creative writing.

There is no "one size fits all" style in technical writing; as with any rhetorical situation, good writers know their audience and create texts that fulfill the purpose. To take a standard technical communication textbook in the field, Markel and Selber (2019) argue that good writing means "choosing words carefully and crafting accurate, clear, concise, and forceful sentences" (p. 102; their other measures of excellence in technical writing include honesty, correctness, usability, comprehensiveness, and professional appearance; p. 10). But good technical writing doesn't mean stuffy writing; as early as 1985, Wight, in *Technical Communication*, writes that "style should present information in natural ways that make it easy for the user to understand and use" (p. 10). Subsequent studies of corporate culture and style further elucidate how writing should be shaped for one's audience; Driskill (1989), for instance, writes: "Corporate culture contributes many of the interpretive standards that affect writers' choices of content, persuasive approach, and word choice" (p. 137; see also Brady, 2011). Quick (2012) argues that successful workplace writers are those who "learn and adapt within the discourse community of the workplace" (p. 232). And certainly Markel (2019) meets the needs of his audience, with a sense of humor coming through in several places in his student-centered textbook.

The corporate culture at PCI similarly affects the documents it develops and uses such as the *Redbook 2.0* and *Blackbook.* Because they were specifically written to reflect PCI culture, the language used in these documents is often informal and the voice

conversational. Here, for example, from the *Blackbook,* is part of the introduction to the discussion of the key word "purposefully":

> At PCI we understand that **EXCELLENCE** is no accident. We define "purposefully" as being intentional and deliberate, and we have achieved our great success by being deliberate and intentional in all that we do. …We create a great place to work, hire the best associates, invest in the right technology and tools, and carefully tailor our services to the individual needs of our clients and constituents. …In other words, we set ourselves up for success by doing everything we do on purpose.
>
> You have likely been on family vacations. They don't just happen. People have to coordinate and schedule for time off. People have to save up in advance for the costs of the trip. They have to plan where they are going to go and make sure they have packed the stuff they need. That's all by design. There are people, one can suppose, that just get into their cars and go. But if they wanted to get to a beach in Florida, that's not going to happen by chance. They are going to have a plan, pack some beach towels, and make sure they have the money to get there. The PCI family knows where we want to go, we have a clear plan to get there, and we make dang sure we pack the towels.

This casual style runs throughout the *Blackbook*, reflecting PCI's culture, in contrast to the more "formal" and "business-like" language found in many corporate documents. PCI is a place where real people are valued as their whole selves, and the conversational voice provided here ensures access by all, another clear indicator of the culture at the company.

This blurring of strictly business-like (or "technical") writing with more informal "creative writing" is developed even further with the inclusion of 17 stories that embody each of the 17 support sentences. Each story is placed in the section alongside the support sentences it exemplifies; following the support sentence "We believe people have potential. We believe people have the capacity for greatness," (fourth overall and first under the core value Unlock Human Potential) is a story about four PCI associates who have risen from entry-level roles to senior positions.

Ideas for the stories were solicited from more than 50 PCI associates. The ACP, under the direction of the CEO, selected 17 stories from dozens of suggestions and held informational meetings with relevant parties for each of these company stories. He incorporated storytelling elements such as figurative language and subjective adjectives and adverbs to fit and support the narratives for each of the 17 statements the stories were designed to illustrate.

As one example, we can look to the story about Ernesto Marcano, featured with the third support sentence under the core value Innovate a Culture of Relationships and Fun: "Choose to be positive. Optimism and resilience are force multipliers" (the 13th overall support sentence). Ernesto, a long-time manager in the inside sales center who recently retired, has successfully struggled against terminal cancer for almost a decade. His inspirational story clearly shows the power of optimism and exemplifies the life-changing power that optimism and resilience can have. To add specificity to the general theme of resilience, the story adds details such as Ernesto taking hot summer bicycle rides "under the scorching Texas sun," an image that is easily translatable though not strictly a fact. Ernesto is described as fighting "a war against a desperate enemy," a metaphor easily understood by others. This storytelling element of the *Blackbook* helps distill Ernesto's manifestation of this core value (resilience) into a meaningful touchstone for future PCI associates who will never have the opportunity to work with him.

Engaging in narrative not only adds a human element to an organization's defining documents but poignantly allows the employees themselves to feel a part of the larger story. Shapiro (2016) notes the effectiveness that "story fragments," which hearken to an organization's mission statements or code of conduct, can have as associates begin to engage with a company's culture and learn the "narrative context" into which these stories belong (p. 3). Similarly, Dragga's (2011) article on codes of conduct notes that, in addition to emotive illustrations, including narratives of heroic individuals is a persuasive way to highlight the code in action. The stories incorporated into PCI's *Blackbook* showcase how an employee embodies the

core value being examined through an inspirational narrative of that core value being lived out. As the next section shows, "earning" the *Blackbook* and accessing the stories contained in it indicates that an associate understands PCI's core values and, as Shapiro suggests, helps them feel part of the company story.

RESULTS AND DISCUSSION

In this section, we briefly relate how the artifacts described above will be used by PCI. While the *Redbook 2.0* is complete and is being fully utilized, the *Blackbook* is still in final stages of production; our discussion of it here describes its intended use upon completion.

Use of the *Redbook 2.0*

The *Redbook 2.0* presents the reader with PCI's overall culture statement, the "5byFIVE" (see Figure 1). The purpose of the *Redbook 2.0* is threefold: to introduce new associates to the company's culture, to provide existing associates with a tangible reminder of the culture, and to represent the company to outside constituents. It presents the Purpose, Vision, Goal, and Promises on a two-page spread (see Figure 8). The booklet adds a second double-page spread in order to answer the ultimate question, "Who are we?" The answers to this final question are the company's core values and list the support sentences on which the focus groups spent so much time.

Employee orientation at PCI attempts to give new associates a crash course in PCI culture. The facilitator of these orientation sessions, often the CEO, employs the *Redbook 2.0* as the guide. New associates encounter PCI through the intentional aesthetic viewpoint present in the booklet. For example, when discussing the core value Innovate a Relationship of Culture and Fun (see Figure 9), new associates are viewing the photograph of a smiling woman, guided through each support sentence, and told the story of a deceased associate, Debra Dale. Debra devotedly worked to bring people together in fun ways and drove associate and company success by building relationships. The illustration reinforces the theme of the story and the support sentences of the core value.

PCI provides every associate with a copy of the *Redbook 2.0*. The booklet is at the workstation of most associates, serving as a tangible artifact of PCI culture and values. It is not uncommon for associates to quote a value or support sentence to resolve a business problem or inform constructive conflict. The *Redbook 2.0* also serves as a marketing tool for external constituents. Prospects, clients, and vendors are often provided with a copy of the *Redbook 2.0* as a way of communicating the kind of company that PCI is and intends to be.

Use of the *Blackbook*

The hardcover *Blackbook* will serve two principle purposes: as a teaching tool and as a reward and recognition mechanism. As associates grow in the company, they are expected to develop mastery of the culture. The technical definitions of the values and the support sentences (all supported by the social science work) provide a foundation for this enculturation. Associates treat the descriptions, definitions, and stories that are now codified in the *Blackbook* as the company's canon for culture. For example, after some months of working for PCI, every associate knows the stories of Debra Dale and Ernesto Marcano. They know that Debra exemplifies fun and relationships and Ernesto represents optimism and resilience. Reading these stories in the *Blackbook* reinforces for associates that they are mastering PCI culture.

Not every associate will immediately possess a copy of the *Blackbook;* it must be earned. The *Blackbook* will be used in advanced training sessions on leadership, diversity, resilience development, and other similar business-related courses offered at PCI by its People Department (enacting the value of Unlock Human Potential). Only after completion of a sequence of classes will associates be awarded the *Blackbook*. Like the *Redbook 2.0*, the *Blackbook* is designed to be kept at the workstation. There, it can act as a tangible artifact of the culture, a source of reference, and a sign of achievement to its possessor.

CONCLUSION

In a rapidly changing market environment, businesses must be wary of creating a set of core values, laying them on the shelf, and failing to communicate them to their key constituents. Values, like every other aspect of a business, change over time in response to fluid organizational conditions. Wise leaders flexibly adapt their values to reflect changes within and outside their organizations and ideally take into consideration

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all their stakeholders: customers, employees, leaders, owners, and communities (Davison, 2005).

This article makes clear contributions for business practitioners concerning creating and living out core values statements. One, it describes how the tools of social science can be used in the development and definition of core values to minimize guesswork, bias, and top-down management influence. In other words, the methods in this case history required that PCI associates inform the company leaders what the values are and what they mean. This is very different than management dictating the meaning of values to employees.

Second, and more importantly, this article makes a strong argument for substantial investment in creating corporate cultural documents. Vision statements, mission statements, and value statements are important cultural artifacts within each company. When developed correctly and enacted intentionally, they can serve to define the meaning and purpose of the work done by each employee. Given the importance of these artifacts, this article argues that using a process that incorporates features of traditional technical writing and fine arts is an investment worth making. PCI's commitment to culture and its willingness to use time and financial resources to support its value system is itself a powerful form of communication. PCI created a cultural artifact, a story, by committing to this resource-intensive process. By combining graphic design, art, photography, and creative writing in its two value artifacts, the *Redbook 2.0* and the *Blackbook*, PCI models a way other committed companies might wish to proceed. PCI's investment in its core values project succeeds in part because it uses technical writing to provide information and the fine arts to drive emotional impact.

Indeed, the case history presented here embodies the ways that creativity undergirds both process and product. The *Blackbook* especially asks us to continue those reconsiderations of the often too-strict divisions between technical and creative writing, between graphics that reinforce a point and graphics that imbue a company's document with life. Because its development depended so heavily on cross-team collaboration and invention, as well as an openness to extend what a traditional "core values statement" contains, the *Blackbook* can be the kind of document that transcends its act of creation; it will likely not merely sit on shelves.

Figure 8. Redbook 2.0 "Our Vision"

Figure 9. Redbook 2.0 "Innovate a Culture of Relationships and Fun"

Similarly, for teachers of technical communication, the above case history underscores the importance of inventiveness in both business and technical communication. We believe we should encourage our students to continue to be creative, to forego the artificial split that many of us in the field continue to perhaps unconsciously practice. Like Shapiro's study (2016), which discusses how narratives can enable innovation and creativity as an organization debates and frames its core values, we can encourage students to engage with all manners of writing as they begin to learn appropriateness of form or function. Yet, as teachers, we are often so focused on the product that students produce, that which we grade, that we may neglect to teach a process to help them arrive at our desired goals for them. Yes, we teach the importance of teamwork, but do we give our students time to run through the messiness that develops from creative iterations of ideas? Business students are told they need to be "strategic thinkers" or innovators, to come up with original ideas with an entrepreneurial spirit. But are they given the heuristic models to help them think creatively? Students might benefit from seeing examples such as the *Redbook 2.0* and the *Blackbook* that more intentionally span traditional categories of writing and thinking and extend the boundaries of what is considered "business communication."

Technical communicators, as noted by Bekins and Williams (2006), can thrive if they more fully position themselves as integral parts of the organization through their creative synthesis and leadership capabilities. Hailey, Cox, and Loader (2010) suggest that we borrow engineering phraseology and practice "innovation," rather than strict "creativity," to increase our job stability as well as to better align our terminology to the business world (p. 126). But whatever we call our skill set, technical writing practitioners can use the development of these deliverables and the deliverables themselves as models of what can be achieved when smart business practice is combined with the fine arts. This case study, with its deliberate, sometimes creatively messy process and its intentionally boundary-breaking deliverables, provides insight into how communicators can be successful: not just "solving" a problem but helping an organization understand the varying facets of a problem first through creative invention and then presenting creative communications that underscore originality (Plung, 2006). We hope it adds to the growing body of literature that urges technical communicators to value what creativity brings to the table and how it can be leveraged as necessary in the workplace.

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Jackie Damrau, Editor

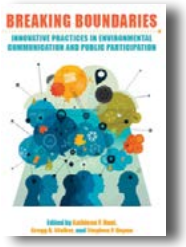
Books Reviewed in This Issue

Editor's Note: *With the advent of the coronavirus sweeping through the world and upsetting business, publishers are also largely affected. Some publishers are still providing books for review; however, others are not. This quarter's journal reviews include reviews of the latest books published from 2018–present. I asked the reviewers to also consider re-reading a book on their technical communication shelf that is a favorite or one that they would recommend to anyone regardless of the copyright date. Hope you enjoy this trip down memory lane for those who may have a copy of the books reviewed. Feel free to email me at jdamrau3@gmail.com if you'd like to provide a review of one of your favorite on-the-shelf books. Requirements: 500 words max with a 50-word bio of yourself. I'll do the rest!*

In the August 2020 issue, the STC member classification for Danielle Villegas was incorrect. She is a senior member and not an Associate Fellow. Apologies, Danielle, for the error.

Breaking Boundaries: Innovative Practices in Environmental Communication and Public Participation

Kathleen P. Hunt, Gregg B. Walker, and Stephen P. Depoe, eds. 2019. State University of New York Press. [ISBN 978-1-4384-7705-3. 344 pages, including index. US$95.00 (hardcover).]



Before Rachel Carson published *Silent Spring* in 1962, environmental policy in the United States was typically shaped by lawmakers without much input from their constituents. Increased interest in environmental action, both in the United States and worldwide, has spurred an even greater interest in participating in public commentary for proposed environmental policies. In *Breaking Boundaries: Innovative Practices in Environmental Communication and Public Participation*, the editors explore the ways in which the public engages with their lawmakers to shape these environmental policies.

This book is a collection of chapters organized around four central themes: public participation should adapt to local conditions and stakeholder concerns, public participation practices should combine innovative approaches to engage the community, limitations of technology and digital media should be considered, and power dynamics between the constituents and the lawmakers should be accounted for (pp. 7–9). Each chapter explores these, and related, themes in a detailed, informative manner.

One major strength of *Breaking Boundaries* is the diversity of settings and communities offered as examples. In my experience, many academic works about public policy written by western authors tend to narrowly focus on dominant-culture American communities, overlooking the unique communities and policy issues that arise both within the United States and globally. The editors and authors provide an illuminating cross section of global communities and the environmental policies that affect them. For example, Chapter 2 explores the listening sessions hosted by the USDA Forest Service with Native American tribes; Chapter 3 examines public participation in land management policy in the American West; and Chapter 7 studies public participation in environmental policy in New Zealand. Through these rich case studies, the reader truly gains a sense of how environmental policy is shaped and the diverse cultural considerations and local factors that can affect it.

Breaking Boundaries is an enlightening collection that is not a casual read. The level of prose and the discussion of communication theory would challenge readers not familiar with public policy and related fields. Further, some chapters dive into the environmental policy scenario without much background or discussion of the issue's history, focusing instead on related communication theory. Academics may appreciate this strategy, while less-experienced readers may find this disconcerting.

A variety of audiences will find this book worthwhile despite its elevated prose and lack of contextual background information. Academics studying environmental communication and/or public policy would do well to have this volume on their shelves, as they will undoubtedly refer to these case studies repeatedly when designing their own research. As an academic myself with a great deal of public policy experiences, I bookmarked several discussions within the text for future reference. Advanced graduate students in technical communication, political science, or environmental or wildlife management would benefit from considering the cases presented.

Nicole St. Germaine
Nicole St. Germaine is a Professor in the Technical and Business Writing Program at Angelo State University, as well as a freelance writer and consultant. Her research interests include technical communication for a Mexican-American audience and technical communication in the health fields.

Designing and Proposing Your Research Project

Jennifer Brown Urban and Bradley Matheus van Eeden-Moorefield. 2018. American Psychological Association. [ISBN 978-1-4338-2708-2. 140 pages, including index. US$29.95 (softcover).]

There's much to like about *Designing and Proposing Your Research Project*: It's a friendly, unintimidating, reasonably comprehensive overview of a complex subject. The authors explicitly note that more reading is necessary; for example, their description of sampling (Ch. 7) won't support quantitative research if you haven't already taken a

statistics course. The many examples, helpful forms, and summary tables concisely present large amounts of information. Unfortunately, two flaws make the book hard to recommend.

First, it needed better substantive editing to eliminate egregious errors. For example, the authors suggest (p. 90) that readers with red–green colorblindness can't see red text (in fact, they can't easily distinguish red from green). Then there are contradictions. For example, the authors note that samples must be representative of the study population in quantitative research (pp. 63–64), then suggest that in qualitative research, it's more important to support the research question (p. 65). Are unrepresentative results more acceptable in qualitative research? Muddy advice includes the suggestion that surveys of adults use 7th to 8th grade language based on a readability formula. Readability formulas are meaningless; a better recommendation would be to use audience-appropriate language. The authors don't define many key terms on first appearance nor link to definitions in the index. For example, triangulation is indexed twice (pp. 56, 58), but with no definition on either page; the actual definition (p. 123) doesn't appear in the index. A glossary would have solved this problem.

Second, the authors incorrectly assume that quantitative and qualitative research are fundamentally different things, rather than different methods applied to the same research questions. Thus, Chapter 4 shows more similarities than differences between these research types. This division leads to subsequent questionable choices such as concluding that acknowledging and accounting for bias is essential in qualitative research (p. 53), but not mentioning its importance in quantitative research. Similarly, the authors emphasize the importance of strong and trusting relationships with subjects in qualitative research (p. 55), but not in quantitative research. Related errors include the belief that only quantitative research requires hypothesis testing. In fact, hypotheses are testable predictions in any type of research.

These flaws make it hard to recommend *Designing and Proposing Your Research Project* for self-study; they will discourage or mislead many readers. The same flaws frustrate its use as a classroom resource, exacerbated by an unpredictable combination of really good information, such as the advice to pretest and correct study methods before using them collect real-world data, with frustrating omissions, such as no discussion of the reproducibility crisis or the many forms of bias. Though the book's title suggests it will teach how to prepare a research proposal, that information is scattered throughout the book rather than gathered into its own chapter.

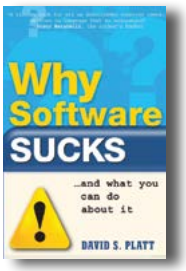
Better editing and a reality check would make a second edition more useful.

Geoff Hart

Geoff Hart is an STC Fellow and author of the book *Writing for Science Journals: Tips, Tricks, and a Learning Plan.*

Why Software Sucks…and What You Can Do About It

David S. Platt. 2007. Addison Wesley. [ISBN 978-0-321-46675-4. 244 pages. US$29.99 (softcover).]



Why Software Sucks…and What You Can Do About It provides insight on why many software programs are hard to figure out and use. Sometimes, programs seem to crash at the worst possible time. Sometimes, programs cause a user to lose information. David Platt, a Microsoft-designated software legend and experienced programmer/consultant, also explains why websites are user hostile. He uses examples from starbucks.com, MS Word, and ups.com. On the other hand, google.com is a good site. Chapter titles include "I don't care how your program works" (p. 15).

Platt notes that many U.S. companies did not improve cars until customers started buying reliable Hondas and Toyotas. He also notes that a user can address issues of poor usability by:

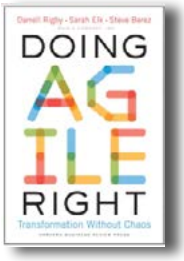
1. Reading reviews before buying.
2 Providing reviews to help others.
3. Providing feedback as programmers may not know what is wrong.

Why Software Sucks is a good read to broaden your understanding of usability. What can help is to understand that programmers are not users. Usability testing should be a necessity, not an afterthought. A lack of usability testing can make the result unusable.

Jeanette Evans
Jeanette Evans is an STC Associate Fellow; active in the Ohio STC community, currently serving on the newsletter committee; and author and co-author of articles and columns in *Intercom*. She holds an MS in technical communication management from Mercer University.

Doing Agile Right: Transformation Without Chaos

Darrell Rigby, Sarah Elk, Steve Berez. 2020. Harvard Business Review Press. [ISBN 978-1-63369-870-3. 238 pages, including index. US$32.00 (hardcover).]



Doing Agile Right: Transformation Without Chaos is a straightforward, no-nonsense look at how senior leaders should approach their business agility journey. It is brimming with practical tips framed as do's and don'ts to guide leaders in becoming agile, not simply doing agile. The authors clearly are sending the message that "becoming" agile is what leads to success. Practical tips are heavily supported by customer examples to show successful and unsuccessful agile transformations, which help drive home key points and set realistic timeframes for change.

Digital disruption is driving the need for businesses to become agile. Today, all businesses are software businesses—regardless of the products and services they offer—because of the technology involved in running a business effectively. Responding to market changes rapidly is key to staying in business and growing market share. Agile is the golden egg when business leaders understand their business's purpose, how agile they want that business to be, and what that means regarding changes to their business. Agile can lead to dramatic improvements in time-to-market; employee morale, productivity, and engagement; higher quality products and services; customer satisfaction; and overall economic outcomes.

No two businesses are alike. Each business must look within to redefine its mission and vision before it embarks on an agile transformation. Businesses must not copy what others have done to become agile as this never works. A business must create its own agile business system by assessing a) the resources available to create the desired results, b) the activities (actions and processes) used to generate results, c) the output of the activities, d) the outcomes (changes and benefits) produced by the activities, and e) the purposes (the long-term, cumulative benefits derived from the activities, outputs, and outcomes). Then, the business must fill the gaps. Crucial to successful transformations are agile experts, agile training and coaching support, technology architectures that support agile, and facilities that promote the agile way of working.

Leaders set the vision for what is to be accomplished and why. They must also learn to think of "value" (not projects) and change the way they budget, fund, and review the work. Agile teams determine how the work gets accomplished and are empowered to make decisions about the work, including how much work can be accomplished in a short timeframe, and how that work is balanced. Customers know best what is valuable to them. When these things are harmonized, an enterprise will effectively deliver "value" to customers in the shortest sustainable lead time.

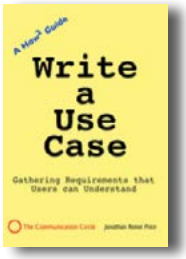
The authors' final message is that transformation to an agile enterprise takes place over time, there is no Big Bang possible. Many leaders seem to run afoul with their transformations because they don't understand how cultural change occurs. It takes time to transform an enterprise and all the individuals that are part of an agile business system, and it takes highly visible, committed leaders actively modeling the agile values, principles, and mindset to do it.

Doing Agile Right is spot on with its practical advice and is a must read for anyone actively involved in an agile transformation.

Cindy Currie
Cindy Currie is an STC Fellow and past STC president. She has served STC as the STC Summit Co-Chair and various other roles. Cindy has over 35 years of experience as a technical communicator, project and program manager, and most recently as an Agile coach and trainer.

Write a Use Case: Gathering Requirements that Users Can Understand

Jonathan Reeve Price. 2020. The Communication Circle. [ISBN 978-0-9719954-5-1. 232 pages, including index. US$9.95 (digital).]



Technical communicators newly tasked with writing requirements will want to purchase Jonathan Reeve Price's *Write a Use Case: Gathering Requirements that Users Can Understand* to better comprehend their role in the process, avoid common mistakes like an overreliance on the development team driving requirements, and eliminate any second-guessing about exactly what they should be doing. This book is for writers. It helps writers create well-crafted requirements and a series of supporting artifacts as well as provides step-by-step instructions complete with examples. Technical communicators finding themselves already in the middle of a requirements gathering project and needing immediate help should proceed directly to Chapter 5, the longest and most informative, to learn how to write use cases. According to Price, use cases are preferable to requirement statements because they include the developer and the stakeholder as audiences and promote discussion, understanding, adaptability, and traceability.

It is atypical to begin reading a book at its end, but if you read Price's Author's Note (p. 206), you'll understand how his cumulative work and teaching experiences enable him to anticipate reader's questions thereby eliminating the gotchas. For example, if a writer is moving from a requirements list to use cases, the number of uses cases will not match the number of requirement statements because one use case may describe multiple requirements. That may not be common sense to the novice requirements writer.

Using examples, Price models concise writing showing readers how they can improve requirements including very specific direction on how the requirement must use "will" or "shall" as an auxiliary verb, describe what the system must do, be measurable, and avoid jargon unless defined clearly in the glossary. The book's format is also an excellent example of technical communication and fosters both learning and retention of material. The use of headings, subheadings, bulleted lists, tables, images, checklists, and workflow diagrams serve as reliable guideposts throughout the book. The step-by-step instructions are invaluable. If you have never written a requirement before, Price walks you through it including the why and how.

Also helpful to the technical communicator is Price's instruction in Chapter 6 about creating a test case. He thoughtfully explains the connection between testing and delivering a quality product and provides five methods to test for quality with an eye always toward the developer and stakeholder audiences. He concludes with a discussion about use cases versus user stories and when it makes sense to use the latter (short, small projects in a rapidly changing environment).

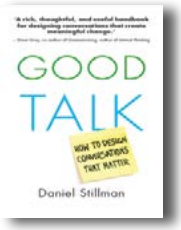
Price bases this book on the Rational Unified Process as the standard but notes that there is no one "sacred standard" (p. 6) with many organizations implementing their own processes around requirements gathering and use cases. Technical communicators will still be a step ahead of any organizational processes if they have this thorough resource to reference.

Liz Herman

Liz Herman, PhD, is an STC Associate Fellow, a knowledge management practitioner and is certified in project management and technical communication. She works for Senture, LLC as its Director of Knowledge Management.

Good Talk: How to Design Conversations That Matter

Daniel Stillman. 2020. Management Impact Publishing. [ISBN 978-94-6276-379-1. 274 pages. US$24.99 (digital).]



Daniel Stillman explains early in his book, *Good Talk: How to Design Conversations That Matter*, that the book's content comes largely from his *The Conversation Factory* podcast that has existed since 2017. What works well for a podcast does not always translate well into a book. While there are some valuable elements in Stillman's book, readers will need to sort through many disconnected examples and rely on materials and resources from other authors that are not necessarily fleshed out in detail. Most readers find examples helpful, but Stillman distracts the reader jumping from Spike Lee's *Do the Right Thing*, to Elon Musk's meeting preferences, to Japanese culture, to Nietzsche all within a few pages. Most readers also find references to other resources helpful, but it is difficult to

parse out Stillman's own thoughts about conversations that matter. It is also worrying that Stillman takes almost a page to explain the book's organization. Once readers reach Part III, they can jump to the other nine elements of the conversation operating system that are most personally relevant. Most examples, however, build upon each other in successive sections.

Think of Stillman's book like an individual workshop for specific conversations readers want to improve. Perhaps it is a conversation with a manager, a colleague, or a partner. He encourages you to grab some sticky notes and jot down answers to rhetorical questions that are placed throughout the book. Stillman quickly helps readers understand that in many cases, we are not even giving conversations a chance to happen. We make assumptions about how others will respond so we do not bother to initiate a conversation. We tell ourselves it will not work before speaking or texting. Stillman uses an example throughout the book about a character named Eleanor to show how to use different techniques. The familiarity of Eleanor is a welcome contrast to the numerous other examples and references.

What is also welcome is Stillman's discussion about cadence and the surprising facts he includes mentioning that it takes people 600 milliseconds to compose thoughts, yet the gap between people speaking is only 200 milliseconds. It is no wonder why conversations go astray when we are spending most of the time composing our thoughts rather than listening to the person speaking.

Regarding the valuable elements mentioned earlier, the discussion around the Circle of Value and using three goals in conversation to understand what people need or are asking is a good takeaway. Stillman's inclusion of Julia Cameron's approach to reflection and writing—the morning pages—is also of interest to those facing writer's block. He offers it here to help us reflect on conversations and improve.

If truly stuck on a conversation that is going nowhere, Stillman's book may unstick things. You may want to pass on the book and go straight to his podcast.

Liz Herman

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Introduction to Three-Dimensional Design: Principles, Processes, and Projects

Kimberly Elam. 2020. Princeton Architectural Press. [ISBN 978-1-61689-921-9. 168 pages, including index. US$29.95 (softcover).]

Introduction to Three-Dimensional Design: Principles, Processes, and Projects is a pedagogical exploration of principles and lessons in designing objects of art using depth, scale and proportion, and other aspects of three-dimensional (3D) design. Kimberly Elam takes a provocative approach toward illustrating 3D design concepts by showcasing the art created by her students in a series of class "experiments" or projects.

The book is divided into five chapters. The first chapter outlines and illustrates many overarching concepts of 3D design. Each subsequent chapter focuses on a different class project that puts these concepts into action. The projects include decorative masks, line-wire animals, paper food, and stunning acrylic birds.

The division of chapters I alluded to, where the first is theory and the remaining chapters are application, is a bit murky. While the first chapter is thoroughly a description of principles and the last three chapters are focused on describing the various deliverables of the student projects, Chapter 2 straddles this division by doing both. Chapter 2, like the chapters that follow it, showcases a project—decorative masks. The descriptions of the students' deliverables take a deep dive into the various theoretical applications of contrast, which seems to continue the thrust of the first chapter. We can see this in the Chapter 2 section headings "Concave to Convex Contrast," "Geometric to Organic Contrast," and "Static to Active Contrast." The focus shifts in Chapter 3, however, when we start to see headings like "Flamingo," "Monkey," and, in Chapter 4, "Cabbage," which describe the form of the students' projects rather than the principles that are at play. A clearer division of focus would help the reader navigate the book and parse the content.

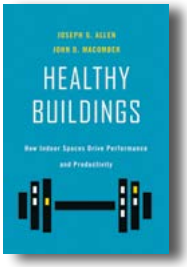
The primary audiences are design students, who will find the principles and design projects useful in their studies, and design instructors, who may adapt or build upon the class projects featured in the book. *Introduction to Three-Dimensional Design* unapologetically favors the tactility of physical objects over the trendy but distant homogeneity of

digital artifacts; however, technical communication practitioners could take a few lessons from the principles illustrated in this book. Many technical communicators are familiar with such principles of two-dimensional design as grid systems, contrast, repetition, alignment, and proximity, but many may not understand how to apply the concept of a vanishing point. For example, assembly and process diagrams can benefit from perspectives afforded by the application of tension and relaxation, atmospheric perspective, shadow, and scale to better communicate the relationships between objects. Although technical communicators will find value in this book, they can safely limit themselves to the first two chapters that more directly address 3D design principles.

Michael Opsteegh
Michael Opsteegh is an STC Associate Fellow and a technical writer in the software and financial services industries since 2004. He is a lecturer in the professional writing program at Cal State Long Beach. Michael holds a master's degree in English and is a Certified Technical Professional Communicator (CPTC).

Healthy Buildings: How Indoor Spaces Drive Performance and Productivity

Joseph G. Allen and John D. Macomber. 2020. Harvard University Press. [ISBN 978-0-674-23797-1. 304 pages, including index. US$35.00 (hardcover).]



I'll start by saying that *Healthy Buildings: How Indoor Spaces Drive Performance and Productivity* is an engaging read, even if public health or environmental, safety, and health are not your primary career focus. The first part of the book is making a case for healthy buildings. Co-author Joseph G. Allen cites studies with this statistic: in North America and Europe, we spend 90 percent of our time indoors. In these terms, it becomes obvious that "our indoor environment would have a disproportionate impact on our health" (p. 39).

Shockingly, we discover that most of our exposure to outdoor air pollution can occur indoors because of infiltration factors like leakiness of a building, windows, and ventilation. Understanding how outdoor air quality affects indoor air quality and seeing the math for how indoor air quality is worse for us because we spend so much time indoors, it is easy to see why business owners, developers, and even CEOs need to understand this element of public health and take action.

Healthy Buildings shares information about indoor air quality, what affects it, and how to make improvements that are cost effective, improve employee health, and increase overall productivity. In Chapter 4, the authors introduce a pro forma income statement that shows how increasing ventilation rates is a relatively low-cost operating expense when compared to the benefit of employees taking fewer sick days and increasing their productivity. The explanation of ventilation and cognitive function will have you questioning the health of your work building (and maybe even your own home!).

Much of this book addresses Healthy Building strategies, with Part II starting with a chapter dedicated to a report, *The 9 Foundations of a Healthy Building*. They are ventilation, air quality, thermal health, moisture, dust and pests, safety and security, water quality, noise, and lighting and views.

We also learn the differences between "green" building certifications (like LEED certification, which stands for Leadership in Energy and Environmental Design) and "healthy" building certification. Healthy buildings are intended to have continuous monitoring of the nine foundations; they are not awarded a one-and-done certificate when they are built.

Allen and Macomber explain in Chapter 9 the benefits of moving from key performance indicators (KPIs) to health performance indicators (HPIs) and give examples of how to measure a building's health impact. This chapter describes how it's been done wrong and how to do it right.

Overall, *Healthy Buildings* is a terrific overview of how Healthy Building strategies are good business strategies. The key is to show that it's a win for all to "improve the health of all people, in all buildings, everywhere, every day" (p. 241). If that piques your interest, take the time to learn from the experiences of Joseph Allen and John Macomber.

Michelle Gardner
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Design Thinking: The Handbook

Falk Uebernickel, Li Jiang, Walter Brenner, et al. 2020. World Scientific Publishing. [ISBN 978-9-811-20350-3. 308 pages, including index. US$38.00 (softcover).]

Traditional design practice tends to operate in a linear manner, with the underlying assumption that everything necessary to a successful outcome can be specified in advance, so that ideally only one prototype is necessary to prove the concept and begin production. When real-world complications arise, they are considered defects in the planning and design process. The most creative ideas, however, arise from accidents and mistakes, not from conscious thought. How, then, can we integrate the efficiency of linear design with the creativity of learning from direct experience?

Design thinking offers an answer. By focusing constant attention on user experience, it retains the direction and structure of classical design methodology. But it does so by replacing theoretical design work at the very beginning of the project with immediate prototyping of potential solutions. Through rapid, iterative prototyping coupled with constant reference to the customer experience, the "micro-cycle" capitalizes on insights arising heuristically from each prototype while maintaining the overall direction, and therefore coherence, of the project. This both disciplines and liberates the design process, leading to a more satisfying solution for the customer.

The micro-cycle begins by defining the problem through open-minded investigation of the customer experience, or "need finding," that is integrated with the design team's technical and aesthetic knowledge. The resulting "ideation" of the product is then realized through repeated, rapid prototyping. Initial ideations may be simple and crude, but are concrete and real, and therefore a source of practical knowledge about the customer experience that can be integrated into the next prototyping phase. As the prototyping approaches apparent completion, the testing phase begins, and reveals whether the product meets the full customer need or redefinition and more micro-cycles are required. Design thinking is therefore a "pragmatic approach that prefers experiment to theory" (p. 19), but with customer expectations determining the extent and nature of the experiments.

The micro-cycle operates within a "macro-process" or overall development methodology realized by iterating a set of micro-cycle prototypes: the "dark horse" (visionary, seemingly improbable); the funky (integrating divergent and convergent design ideas); the functional (complete enough to uncover finalization issues); the "X-is-finished" version (when a single, complex design element works); and the final prototype (ready for manufacture). Design elements can occupy different prototype states at different times, allowing them to be optimized wherever they are within the overall macro-process.

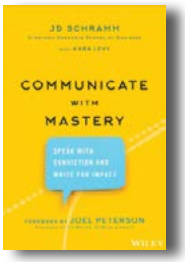
Design thinking emphasizes a tactile, visual approach, especially early in the development process, to keep user experience concretely embedded in the designer's mind: "Design thinkers prefer to work visually. Instead of logging data and information into computer systems, they cover walls with Post-its. Instead of talking about abstract concepts, they quickly build prototypes" (p. 24). Given user frustration with products and services, the need for design thinking is obvious, and its growing impact is encouraging. Hence the importance of *Design Thinking: The Handbook*: it both provides tools and techniques for design thinking and illustrates the principles of usability advocated within through its own layout and organization, and so serves as its own best recommendation.

Donald R. Riccomini

Donald R. Riccomini is an STC member and was a senior lecturer in English at Santa Clara University, where he specialized in engineering and technical communications. He previously spent twenty-three years in high technology as a technical writer, engineer, and manager in semiconductors, instrumentation, and server development.

Communicate with Mastery: Speak with Conviction and Write for Impact

J. D. Schramm with Kara Levy. 2020. Wiley. [ISBN 978-1-119-55009-9. 212 pages, including index (hardcover).]



Communicate with Mastery: Speak with Conviction and Write for Impact is a good personal library addition if you appreciate how important it is to communicate clearly and effectively in dealing with clients, customers, and other business professionals. The book is divided into three sections focusing on a different communication aspect. Each section provides excellent guidance for someone wanting to improve their communication practices with the last third providing significant tips and resources.

Know Your Audience is one of the key messages with which technical communicators should be familiar. J. D. Schramm reminds us that engaging your audience is almost as important as the words themselves. He then explains ways in which you can tailor your message to suit a specific speaking occasion. While the book is mostly focused on oral and visual presentations, the chapter on writing for impact is a good refresher for any writer looking to brush up their skills.

Since we are immersed in such a visual culture, the discussion shifts from a focus on writing to that of a visual focus: presentation, performance, and delivery. The advice is straight up from public speaking books—good posture, eye contact, gestures—and Schramm's experience working with Stanford College students to deliver award-winning TeD Talks. Enthusiasm goes a long way in getting an audience immersed in the words and images you are communicating. The message, while important, isn't usually enough to engage people to act!

Communicate With Mastery has an excellent chapter on tailoring your communication goal. Schramm points out how easy it is to engage an audience using storytelling and how you can weave stories together into a presentation, so they don't seem overused or inappropriate. There's also some good advice about how to use visuals to reinforce main points, but I felt there could have been some additional information about designing such visuals.

The discussion on leadership covers what it means to be in control of a speaking situation. This comes by way of promoting and reiterating to your audience the positive aspects of yourself and the benefits of your presentation. Being in control in speaking, for example, is narrowing your focus and fine-tuning the three areas most important for information presentation: verbal, vocal, and visual. Just being conscious of verbal fillers such as "yea" and "um" and "like" means that you are gaining awareness of what it takes to be a more effective speaker.

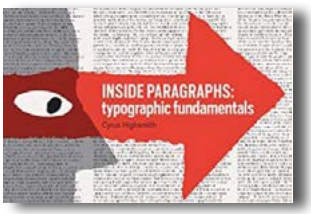
All in all, *Communicate With Mastery* provides excellent direction for the individual seeking to develop the communication skills necessary in a fast-paced business environment. It's a tight, concise presentation that enhances its usability and makes it a fine first addition to any business communicators' library.

Lynne Cooke

Lynne Cooke is currently a Clinical Assistant Professor at Arizona State University where she teaches courses in technical communication, digital writing, and usability. She has presented at several STC conferences and has published two articles on eye tracking in STC's *Technical Communication* journal.

Inside Paragraphs: Typographic Fundamentals

Cyrus Highsmith. 2020. 2nd ed. Princeton Architectural Press. [978-1-61689-941-7. 104 pages. US$19.95 (softcover).]



As a beginning student of typography, have you felt confusion and dismay when tackling a detailed, rules-heavy book on the subject? Well, take heart. Type authority Cyrus Highsmith has published a short, highly visual book that illustrates the fundamental principles and no more.

At the same time, it can serve well as a review text for experienced communicators. And the author makes the study of typography feel worthwhile: "good typography does more than make text legible. It can add depth and character to the presentation" (p. 101).

Highsmith's six chapters show how elements of paragraph design—specifically, white space—can enhance readers' experience. He briefly examines Gutenberg's innovations to show how type works, focusing on the white spaces within a letter, between

letters, between words, and between lines. He goes on to show how spacing impacts the reading process.

The core of the book is the four chapters on letter space, white space and line space, paragraph settings, and fine tuning. In most page spreads, Highsmith places explanatory text on the right and graphic examples on the left. This here's-how-it's-done approach lets you experience one moment of gotcha after another, much as when we read through a book published by America's Test Kitchen to see just why each step of a recipe works.

We learn, for example, the principle of tempo within a paragraph, to which other authors don't even allude: "Tighter spacing equals a fast tempo, while looser spacing results in a slow tempo. To maintain an even flow . . . the tempo should be consistent in each part" (p. 79). Much is said about hyphenation and justification: "Justification settings have the potential to undo the careful work that went into determining the appropriate tracking on the overall paragraph settings. Therefore, in the justification settings . . . set the optimum letter space to 0%" (p. 95).

Interestingly, Highsmith has designed the fonts used for the body text and headings in the book. He goes on to hand-letter all captions for the many illustrations. The font devised for this purpose, unfortunately, is hard to read.

Although the book is short, it would have been a good idea to include a topical index of perhaps two pages. The student wishing to review, for example, the advice about tempo might not recall that it's located in the middle of the chapter on paragraph settings.

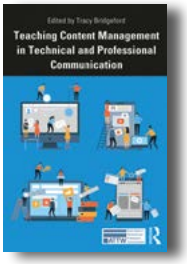
If I want more detailed discussions and expansion upon typographic niceties, I turn to Robert Bringhurst, whose bible on type, *The Elements of Typographic Style*, is now in its fourth edition (Hartley & Marks, 2012). But if I want to introduce typography to students or do a fast lookup on a topic, I pick up *Inside Paragraphs*.

Avon J. Murphy

Avon J. Murphy is an STC Fellow and technical editor in western Washington. A retired college professor and government writer, he is a contractor and principal in Murphy Editing and Writing Services, specializing in computer and Web technologies. Avon served as book review editor for *Technical Communication* for 17 years.

Teaching Content Management in Technical and Professional Communication

Tracy Bridgeford, ed. 2020. Routledge. [ISBN 978-0-367-18126-0. 248 pages, including index. US$44.95 (softcover).]



My first reaction when seeing *Teaching Content Management in Technical and Professional Communication* was, "It's about time." Instruction on content management (CMS) and structured authoring should be integrated into every aspect of technical communication curricula. Every graduate needs a basic understanding of these industry standards and concepts if they are to function in the current workplace.

In Chapter 2, Saul Carliner maps the importance of this coursework to the competencies a typical technical communicator needs. The best chapters in the book were the ones where the chapter authors included specific examples of assignments and explained why they are important. Instructors can take the examples and easily adapt them to their existing courses.

Chapter 8, which discussed inclusive audience analysis, gives excellent advice about this sometimes-touchy topic. The chapter would have benefitted from connecting the dots more clearly between internationalization (which, at its heart, is about removing cultural bias) and inclusivity. Chapters 9–11 provide additional concepts on structured authoring, project management, and global readiness that instructors should incorporate into every aspect of their coursework. The Afterword looks forward toward Content 4.0 and its implications for how we teach technical communication.

I took issue with two themes in the book's introduction and in Chapter 1: First, that CMS is new. It's not. The concept has existed for as long as filing systems and library science have, and the technology has existed for decades. Frankly, academia has been slow in responding to this trend. Second, the technology is "out of the cognitive reach of most technical communicators" (p. 30). The condescension oozing from that statement almost made me quit reading. Academia really needs to stop promulgating these negative views of our profession. They aren't true and are extremely damaging. In addition, I was disappointed to see so many references that were 10–12 years old. The technology has advanced significantly in

the past 5 years, as has level of complexity and the way we approach our work in industry. This is an area that requires constant updating.

Every technical communication program should incorporate structured authoring and content management concepts into every aspect of the curriculum. As the authors demonstrate, you can weave these concepts into existing courses easily. Some of the assignments could be adapted for corporate workshops as well.

Katherine (Kit) Brown-Hoekstra

Kit Brown-Hoekstra is an STC Fellow and former Society President, and award-winning consultant. As Principal of Comgenesis, LLC, Kit provides consulting to her clients on localization and content strategy. She speaks at conferences worldwide and publishes regularly in industry magazines. She recently edited *The Language of Localization*. Her blog is www.pangaeapapers.com.

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